Panasonic
ideas for life

Aicure UV Curing System
LED Spot Type
UJ20 Series
User's Manual

Thank you for your purchase of the Aicure LED spot UV curing system.

- In order to use the system correctly, please read this User's Manual carefully before use. After you have read it, store it in a secure location, and refer back to it if you have any uncertainties.

LED product safety precautions

LED Product Classification

The light source of the LED head connected to this product is classified as 3B under the JIS C6802 “Safety of laser products.”

Max output: 330mW	Wavelength: 365±5nm
Class 3B LED Product	JIS C6802 : 2005

⚠ DANGER

Controlling or calibrating this product by other than the procedures stipulated here could cause exposure to dangerous LED radiation.

- Do not look directly at LED-UV light, or at LED-UV light reflected in a mirror or other reflective surface. Doing so could cause eye damage.
- Install the main unit so that humans are not exposed to LED-UV light.

  Exposure could injure the skin or cause other injury.
- Always turn off the key switch, before cleaning the LED head.

  Cleaning the head while the switch is on could cause eye damage or injury to the skin.
- Never disassemble this product. Disassembling this product could cause exposure to LED-UV light, causing eye damage or injury to the skin.
- If there is a risk of the LED-UV light being exposed to UV reflective light, place the product inside a cover with proper reflectance and heat characteristics to block that reflective light.
- When operating the controller, set up the system so that the path of the LED-UV light is not at eye level.
- It is strongly recommended that a protective barrier be placed around the product so that people cannot approach it while it is operating.
- Always wear the UV protective goggles when using this product.
- Never operate this product in a manner not described in this manual. Doing so risks exposure to LED-UV light.

Safety Precautions for Users

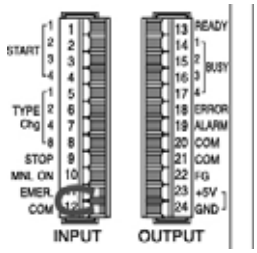
JIS C6802 stipulates user guidelines pertaining to safety precautions to be taken by users and management standards. In the case of this product, please implement safety precautions for a class 3B LED product. See JIS C6802, “Safety of laser products” for details. In the abroad, see the standard according each country.

Safety features

This product is equipped with the following safety features based on JIS C6802 Safety of laser products.

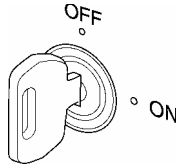
■ Remote interlock

UV radiation can be stopped by opening INPUT terminal “EMER (11)” on the rear of the controller. It is shorted with a shorting bar as a factory default.



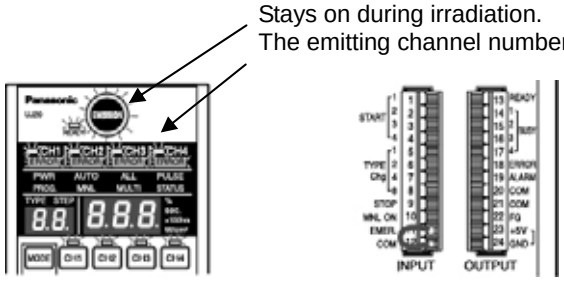
■ Control by a key switch

The controller unit of this product is started via a key switch. Ensure that the key is removed while this product is not in use.



■ LED radiation warning

Turning ON the key switch enables the irradiation of LED UV light, which turns on the irradiation warning indicator on the front panel of the controller. If the LED connection cable is longer than 2 m, or if the controller unit is installed in an invisible part of the equipment, another warning indicator needs to be provided in a visible location around the LED head. [OUTPUT terminals “+5V” (23) and “GND” (24) on the rear of the controller output signals when the key switch is turned ON.]



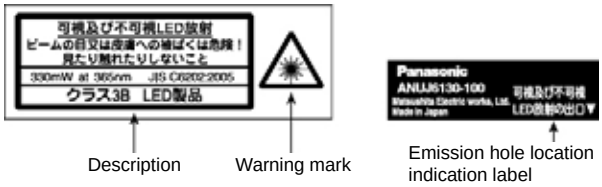
■ Emergency reset

If an error occurs, eliminate the cause and then hold down “SET” for one or two seconds to clear the error. Or, hold down “SET” for five seconds or more to forcibly clear the error.

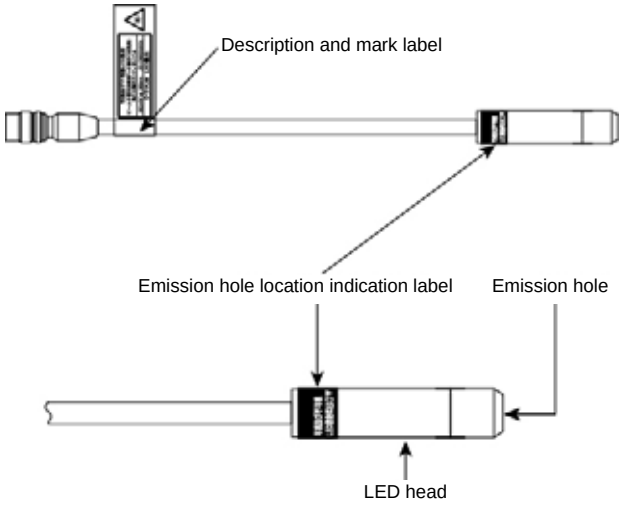
Labels

The LED irradiation warning labels shown below specified by JIS C6802 are attached to the LED heads before this product is shipped from the factory. Warning labels in Chinese that comply with GB standards and those in English that comply with IEC/EN standards are also included.

■ Warning labels in Japanese (JIS)



■ Label locations



■ Warning labels in Chinese (GB standards)

If this product is used in China, attach the labels shown below over the Japanese labels.

■ Warning labels in English (IEC/EN standards)

If this product is used outside Japan or China, attach the labels shown below over the Japanese labels.

VISIBLE AND INVISIBLE LED RADIATION
AVOID EXPOSURE TO BEAM
330mW at 365nm IEC/EN 60825-1 A2 : 2001
CLASS 3B LED PRODUCT
Aperture label
VISIBLE AND INVISIBLE
LED APERTURE

The purpose of the following caution indications is to ensure the safe and correct use of this product in order to protect users from injury and prevent property damage.
The caution indications to prevent possible human injury and property damage caused by incorrect use are classified into **“DANGER”** and **“WARNING”** depending on their degree and severity.

All caution indications are critical for ensuring safety and must be strictly observed.

⚠ DANGER Failure to observe the instructions can result in death or serious injury.
⚠ WARNING Failure to observe the instructions can result in injury or property damage.

Symbol examples

⃠: This symbol denotes a Prohibited action.
The left-hand example denotes “Do not disassemble”.

●: This symbol denotes a Mandatory action or an Instruction.
The left-hand example denotes “Mandatory”.

⚠ DANGER	
Prohibited	● While the LED is lit, protect your eyes and skin from direct exposure to the light and any strong reflections. Failure to do so may result in inflammation of the eyes or skin. This product uses a Class 3B LED source.
Mandatory	● Wear protective the UV goggles and other protective gear during operation. Failure to do so may result in inflammation of the eyes or skin. The wavelengths of some UV rays generated by this product are 365 nm. Therefore, make sure to wear UV-filtering goggles
Do not disassemble	● Never disassemble, repair, or modify this product in any way other than specified in this User Manual. Such actions may result in an accident or injury.

⚠ WARNING	
Mandatory	● Make sure to disconnect the power plug from the outlet after use of this product. Insulation deterioration may result in electrical shock or fire.
	● Pull the plug, not the cord, to unplug this product. A short circuit may result in electrical shock or fire.
	● Do not use any input power supply outside the specified range. Such actions may result in fire.
Prohibited	● If the power cord or plug is damaged, or if contact between the plug and receptacle is loose, do not use the product. Such actions may result in electrical shock, short circuit, or fire.
	● Do not use this product in a place where temperatures vary widely or dew condensation occurs. Such actions may result in product malfunction.
	● Do not use this product in a place where a large vibration or impact can be applied. Such actions may result in product malfunction.
	● Do not hold the controller by hand during use. (This is not a hand-held type.) Such actions may result in electrical shock.

Precautions for use

1) Do not connect this product to any power supply outside the power supply voltage and frequency range indicated on the main unit and in this User's Manual. Otherwise, this product may be damaged. The power cable supplied with this product is a 100 V cable for use in Japan only. When using this product outside Japan, use a power cable that has been certified by applicable standards and has a plug shape that fits the receptacle used in each country.
2) Use this product under the following operating conditions; otherwise, the product life may be shortened.
   Ambient temperature: Controller: 0 to 35°C
   Head: 5 to 35°C
   Relative humidity: 85% or lower (with no condensation)
   Operation environment: Use this product in a location with minimum dirt, dust, or oil mist under no extreme temperature changes, severe vibrations, or shock.
   Storage temperature: -10 to +60°C at 85% or lower relative humidity (with no condensation)
3) Do not place anything on the controller or block the air vents around this product to prevent the occurrence of burns due to overheating.
4) When using more than one controller, do not bundle the supplied AC adapters together. The AC adapters may overheat and damage the products.
5) When handling the LED head, do not touch the lens or LED with bare hands.
   If a foreign substance adheres to the lens or LED, it can cause the UV intensity to decrease and the curing performance to degrade. If bare hands touch the lens or LED, wipe it clean with alcohol.
6) Be careful not to drop or apply shock to the LED head. Doing so may damage this product.
7) Do not repeatedly bend the LED head or the connection cable, as this may result in breakage.
   If any part of the LED head is broken, the whole LED head must be replaced.
8) Set the rubber feet of this product on a flat horizontal surface.
   Do not tilt this product or put it on its side or upside down during use. The product may overheat and be damaged.
9) Noise superimposed on the power supply may cause the LED head or control power supply to malfunction. In such cases, install an insulating transformer or a noise filter.
10) Do not share a power supply with an motor, dielectric machinery, or equipment that consumes high power.
11) Do not use any cable other than the supplied connection cable to connect the LED head to the controller.
12) Ensure that the connection cable approx. 80 mm from the connector is kept free from flexing stress and the joint between the connector and the cable is kept free from tension. Otherwise, the cable may be broken.
13) If the LED connection cable is longer than 2 m, or if the controller unit is installed in an invisible part of the equipment, a warning indicator needs to be provided in a visible location around the LED head. Use "+5V" (23) and "GND" (24) on the rear of the controller as outputs for the indicator. They output signals when the key switch is turned ON.

Warranty

- This product will be repaired free of charge if it malfunctions under normal use conditions within one year of delivery.
  Note that, however, the warranty does not apply to malfunctions attributable to your company, consumables, and/or unavoidable problems resulting from such occurrences as natural disasters.
- The warranty for the LED head is valid for one year from delivery or 5,000 hours of total irradiations, whichever comes first.

Compensation for Production

- We will not compensate the user for losses due to production shutdowns and/or defects caused by any malfunction of this product.

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1 Features of the UJ20: Aicure

The UJ20: Aicure is an UV curing system that quickly hardens UV resins (inks, adhesives, and coatings) via irradiation with UV light from an LED light source. Focused irradiation of UV resins coated on minute surfaces (2 to 3 mm dia.) such as the lenses of CD, MD, and DVD players, and the LCD panels of notebook PCs and the like, with UV radiation enables precise adhesion.

■ High-power irradiation: 8,000 mW/cm^2 (When the Power Mode is on and an ANUJ61523 head is used)

Higher intensity and wider range of irradiation reduces the production cycle time.

■ Long LED life: 20,000 hours (LED life: Total irradiation time before the UV intensity becomes 70% of the initial value)

This LED life is over six times that of our conventional lamp model and reduces the running cost.

■ UV curing without temperature increases

A single 365-nm LED UV light source is used, which does not include infrared radiation. This eliminates the risk of heat damage to the workpiece.

■ Stable UV intensity

UV intensity is kept constant, even if the ambient or LED temperature changes.

■ Easy-to-install LED head

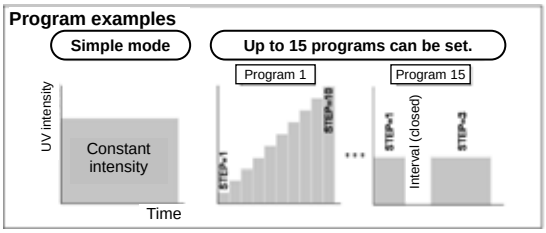
At 12 mm dia. x 50 mm len., the LED is easy to mount on a jig. Mounting the LED head in place reduces overheating and increases UV intensity.

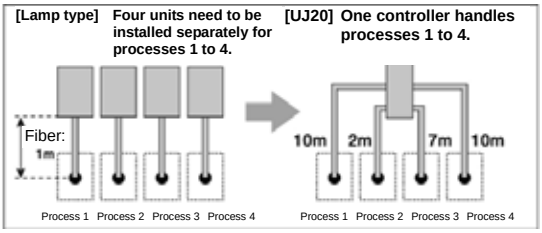
■ No cooling fan construction allows the use in a clean room

There is no need to deal with exhaust.

■ Programmable UV irradiation with four individually controlled heads

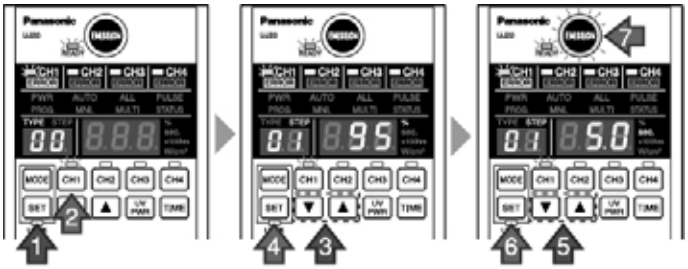
Each LED head can be independently controlled. The heads can also be controlled all together or in combination. Up to 16 different operation programs can be stored for each channel, including one program for the constant intensity irradiation and 15 programs composed of up to 10 steps each.




[Lamp type]
Four units need to be installed separately for processes 1 to 4.
[UJ20] One controller handles processes 1 to 4.
Fiber:
1m
10m
2m
7m
10m
Process 1 Process 2 Process 3 Process 4
Process 1 Process 2 Process 3 Process 4

■ Universal design for easy operation

Easy operation has been achieved by the product's universal design, including the large-sized color LED display with a high level of visibility and the operation switches located at optimal locations.
In simple mode, UV irradiation can be started simply by setting the UV power and irradiation time, and then pressing [EMISSION].



(1) Press [SET], choose TYPE 00 (simple mode), and press [CH1] (the target head).

(2) Set the irradiation intensity by pressing [▼] and [▲] switches, and press [SET].

(3) Set the irradiation time by pressing [▼] and [▲] switches, hold down [SET], and press [EMISSION] to start UV irradiation.

■ Multiple safety features

This product has a function to detect breaks and short-circuiting of the LED head. The LED is automatically turned off if it overheats due to ambient temperature rise or other conditions. UV irradiation can be brought to an emergency stop by opening INPUT terminal "EMER (11)" and short-circuiting "STOP (9)" and "COM (12)" on the rear of the controller during irradiation.

■ Detachable terminal blocks for external connection

The detachable terminal blocks facilitate connections with external equipment.

■ Universal power supply

The supplied AC adapter is a universal type for 100 to 240 V AC ± 10%.
(The supplied AC adapter power cable is a 100 V AC cable for use in Japan only.)

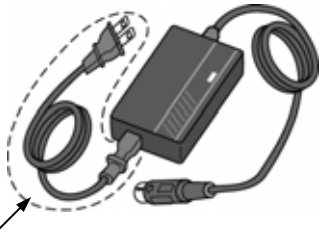
2 Product components

Please check the contents of your package.

Basic package

Controller

AC adapter (100-240VAC)



100 V AC power cable for use in Japan only

When using this outside Japan, use a power cable that has been certificated by applicable standards and has a plug shape that fits the receptacle in each country.

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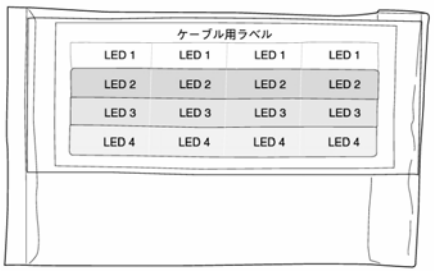
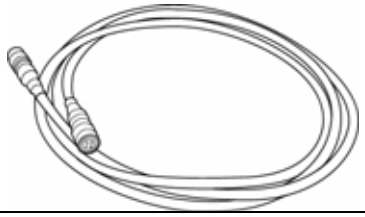
Optional components

Cable labels (attached to the connection cable)



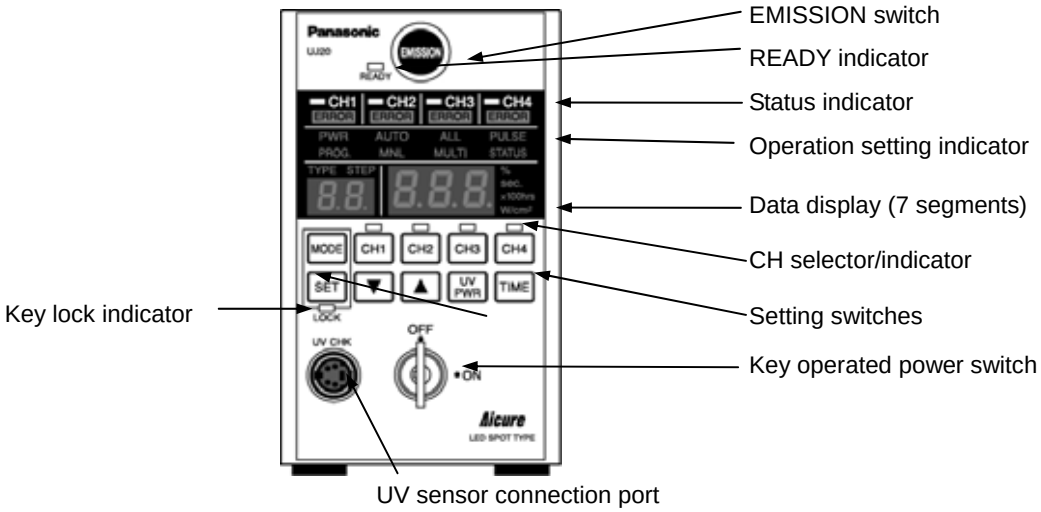
LED head (with lens)

Connection cable



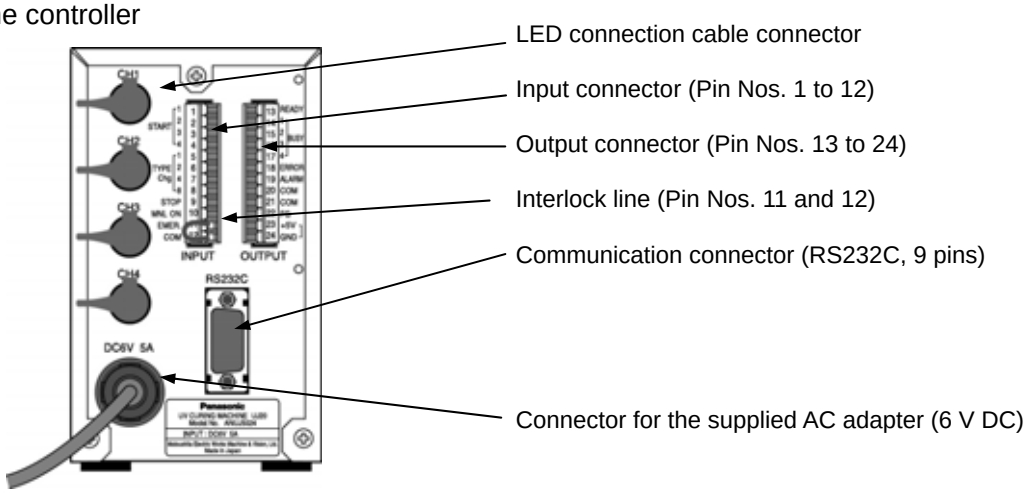
3 Part names and functions

Front of the controller

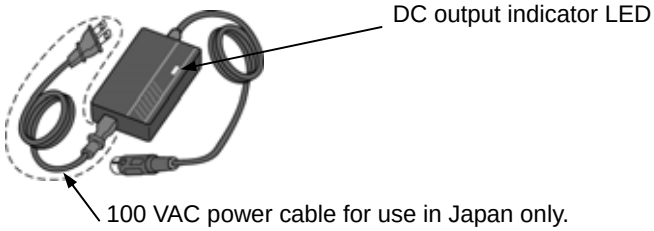


UV sensor (Option)

Rear of the controller

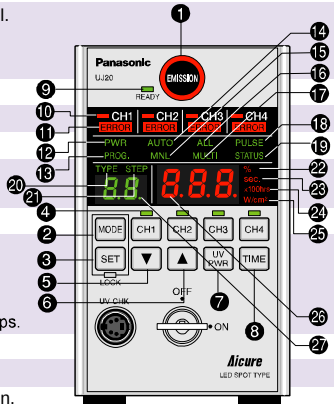

LED connection cable connector
Input connector (Pin Nos. 1 to 12)
Output connector (Pin Nos. 13 to 24)
Interlock line (Pin Nos. 11 and 12)
Communication connector (RS232C, 9 pins)
Connector for the supplied AC adapter (6 V DC)
INPUT
OUTPUT
RS232C
DC6V 5A

Supplied AC adapter



Switch panel

No.	Name	Switch	Indicator	Description
1	EMISSION	○	Red	Starts/stops MNL irradiation, and starts/emergency-stops AUTO irradiation. The indicator stays on during irradiation.
2	MODE	○		When held down, switches between the setting and AUTO modes. Cancels the entry.
3	SET	○		When held down, switches to the TYPE00 setting mode. Accepts the entry. When held down in setting mode, saves the accepted settings in memory.
4	CH1 - 4	○	Green	Switches the display and selects the channel. Flashes in the AUTO mode or setting mode. Lit when the program selection is accepted.
5	▼	○		Decreases the setting value.
6	▲	○		Increases the setting value.
7	UV PWR	○		Switches to the UV intensity level display.
8	TIME	○		Switches to the UV irradiation time display. When held down, switches to the total time display.
9	READY		Green	Stays on while AUTO irradiation is ready.
10	CH1 - 4		*Green *Red Orange	Stays on while the LED head is connected. Flashes during irradiation. When a warning is issued, flashes during irradiation and stays on after the irradiation stops.
11	ERROR		Red	Turned on when an error occurs.
12	PWR		Green	Abbreviation for "power". Turned on when the power mode is turned on.
13	PROG.		Green	Abbreviation for "program". Stays on during program setting.
14	AUTO		Green	Auto mode (Set by default when the power is turned on)
15	MNL		Green	Abbreviation for "manual". Stays on in manual mode (Top of the setting mode). Flashes when an external signal switches the mode to manual.
16	ALL		Green	Stays on in the batch irradiation mode. (The channels selected for the program start irradiation simultaneously.)
17	MULTI		Green	Stays on in the individual irradiation mode. (An external start signal starts irradiation through the channels individually selected for the program.) (Pressing EMISSION on the controller starts simultaneous irradiation.)
18	PULSE		Green	Stays on in pulse start mode. (Irradiation starts at the leading edge of the start signal.)
19	STATUS		Green	Stays on in status start mode. (Irradiation starts at the leading edge of the start signal, and stops at the trailing edge of the start signal input during irradiation.)
20	TYPE		Green	Stays on while the product type is displayed.
21	STEP		Green	Stays on while the program step is displayed.
22	%		Green	Stays on while the UV intensity level is displayed.
23	sec.		Green	Stays on while the irradiation time is displayed. (During AUTO radiation: Counting down During MNL radiation: Counting up)
24	X100hrs		Green	Stays on while the total irradiation time is displayed and during the process of setting the LED replacement time. (Stays on after the time warning is issued in AUTO mode.)
25	W/cm2		Green	Stays on while the maximum UV intensity is displayed.
26	Display (3 digits)		Green Green	0 - 100 % 0,0.1 - 99.9, 100 - 999 sec 0.00 - 9.99, 10.0 - 99.9, 100 - 999 X100hrs 000, 0, 0.01 - 9.99 W/cm2 "On", "OFF" (during PWR mode setting)
27	Display (2 digits)		Green	Product type: "00" to "15"

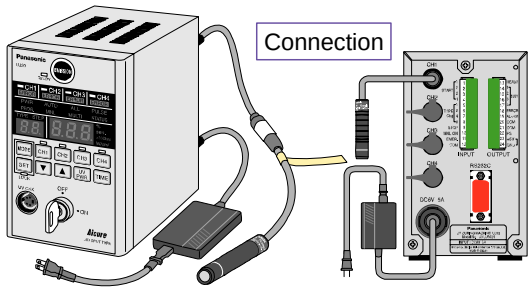


* Speed of flashing during irradiation

Temp. < Standard temp.:	Slow
Standard temp. ≦ Temp. < Warning level temp.:	Mid
Warning level temp. ≦ Temp. < Abnormal temp.:	Quick

■ Simple mode setting

1 Irradiation with default settings

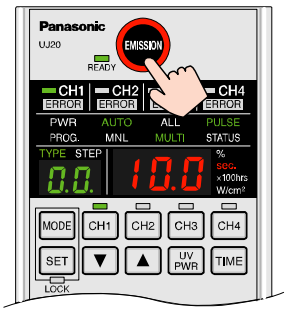


*** The factory-default settings are shown below.**

Configuration

| Controller | AC adapter
| LED head | Lens | Connection cable

Default settings
Type TYPE00 : Program for irradiation at constant intensity : Number of heads: 1 (CH1) : STEP 1 is set. (UV intensity level: 100% Irradiation time: 10.0 sec)
Irradiation mode ALL: Batch irradiation
Start mode PULSE: Pulse signal start

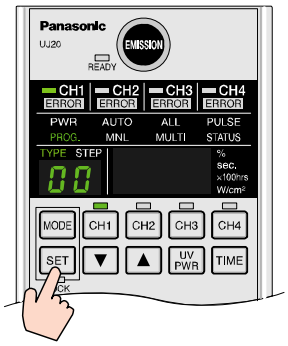


1. Connect the LED head to CH1.
2. Connect the AC adapter.
3. Insert the key into the key switch and turn it to the right (to power on the controller).
   After the startup display appears, a beep sounds and the READY indicator is lit.
   * Press UV PWR to display the UV intensity level, and press it again to display the LED head temperature.
   * Press TIME to display the irradiation time.
4. Press EMISSION. A beep will sound and irradiation will start.
   The EMISSION indicator stays on during irradiation.
   When completed, irradiation stops with a beeping sound, and the READY indicator is turned on.

2 How to change the default settings

Note: The setting change will be cancelled if the panel is left untouched during the setting change operation.
Note: Press MODE to cancel the setting change and go back to AUTO mode.
Note: The display flashes during the setting change operation.
Note: Hold down SET during setting to save accepted settings in memory and go back to AUTO mode.

❶ Switch to setting mode.



1. Hold down [SET].
   (The AUTO mode display switches to the TYPE00 setting mode display.)

❷ Select CH1.

2. Press the target channel switch.
   (The indicator of the channel selected for the program will be turned on.)
   (You don't need to select the channel because [CH1] has already been selected by default.)
   Press [SET].
   (To accept the selection of CH1 and go to the UV intensity level setting screen)

❸ Set the UV intensity level of CH1.

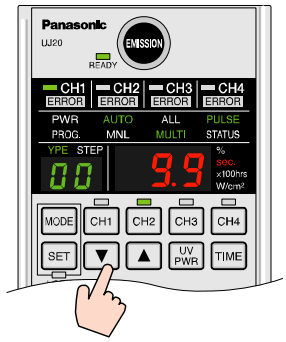
3. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
4. Press [SET].
   (To accept the UV intensity level and go to the irradiation time setting screen)

❹ Set the irradiation time of CH1.

5. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
6. Press [SET]. (To accept the irradiation time and go back to the setting mode)
   (You can hold down SET, skipping the step that requires pressing it.)
7. Hold down [SET].
   (To save the UV intensity level and the irradiation time in memory, and go back to AUTO mode)

3 How to switch the irradiation channel (e.g. From CH1 to CH2)

❶ **Switch to setting mode.**



❷ **Select CH2.**

❸ **Set the UV intensity level of CH2.**

❹ **Set the irradiation time of CH2.**

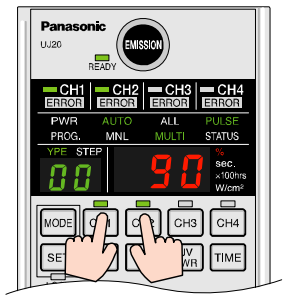
1. Hold down [SET].
   (The AUTO mode display switches to the TYPE00 setting mode display.)
2. Press [CH2]. (Press the target channel switch.)
   (The indicator of the channel selected for the program will be turned on.)
3. Press [SET].
   (To accept the selection of CH2 and go to the UV intensity level setting screen)
   * If you hold down SET rather than press it, only the channel change will be saved in memory, and the controller will go back to AUTO mode. (The other settings will not be changed.)
4. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
5. Press [SET].
   (To accept the UV intensity level and go to the irradiation time setting screen)
6. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
7. Press [SET]. (To accept the irradiation time and go back to the setting mode)
   (You can hold down SET, skipping the step that requires pressing it.)
8. Hold down [SET].
   (To save the UV intensity level and the irradiation time in memory, and go back to AUTO mode)

4 How to make the same settings for two or more channels# (e.g. Make the same settings for CH1 and CH2)

❶ **Switch to setting mode.**

❷ **Select CH1 and CH2.**

❸ **Set the UV intensity level.**



❹ **Set irradiation time.**

1. Hold down [SET].
   (The AUTO mode display switches to the TYPE00 setting mode display.)
2. While holding down [CH1], press [CH2].
   (While holding down one CH switch, press the other switches for channels to be selected one by one.)
3. Press [SET].
   (To accept the selections of CH1 and CH2 and go to the UV intensity level setting screen.)
   * If you hold down SET rather than press it, only the channel change will be saved in memory, and the controller will go back to AUTO mode. (The other settings will not be changed.)
4. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
   When two or more channels are selected, the display shows the setting for the flashing channel. In this condition, the displayed setting can be changed and applied to all selected channels.
5. Press SET.
   (To accept the UV intensity level and go to the irradiation time setting screen)
   * If you hold down SET rather than press it, the selections of the channels and the UV intensity level setting will be saved in memory, and the controller will go back to AUTO mode.
6. Press [▼] and [▲] until the value to be set is displayed.
   (Hold the switches down to accelerate the increment/decrement speed.)
7. Press [SET]. (To accept the irradiation time and go back to the setting mode)
   * You can hold down SET, skipping the step that requires pressing it, to save the UV intensity level and irradiation time settings in memory and go back to AUTO mode.
8. Hold down [SET].
   (To save the UV intensity level and the irradiation time in memory, and go back to AUTO mode)

5 How to make different settings for two or more channels # (e.g. Make different settings for CH1 and CH2)

❶ Switch to setting mode.

1. Hold down [SET].

2. Press [CH1].

❷ Select CH1.

3. Press [SET].
   (To accept the selection of CH1 and go to the UV intensity level setting screen)

❸ Set the UV intensity level.

4. Press [▼] and [▲] until the value to be set is displayed.
   (To accept the UV intensity level and go to the irradiation time setting screen)

5. Press [SET].
   (To accept the UV intensity level and go to the irradiation time setting screen)

❹ Set irradiation time.

6. Press [▼] and [▲] until the value to be set is displayed.

7. Press [SET].
   (To accept the CH1 irradiation time and go back to the setting mode)

❺ Select CH2.

8. Press [CH2].

9. Press [SET].
   (To accept the selection of CH2 and go to the UV intensity level setting screen)

❻ Set the UV intensity level.

10. Press [▼] and [▲] until the value to be set is displayed.

11. Press [SET].
    (To accept the UV intensity level and go to the irradiation time setting screen)

❼ Set irradiation time.

12. Press [▼] and [▲] until the value to be set is displayed.

13. Press [SET].
    (To accept the CH2 irradiation time and go back to the setting mode)

❽ Select CH1 and CH2.

14. While holding down [CH1], press [CH2].
    (The CH1 LED will be turned on, and the CH2 LED indicator will flash.)

❾ Save the settings in memory and end the setting mode.

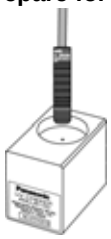
15. Hold down [SET].

(To save the selections of CH1 and CH2, the UV intensity level, and the irradiation time in memory, and go back to AUTO mode)

6 How to measure the UV intensity (e.g. CH1)

You can check the UV intensity of the simple mode program by using the optional UV sensor.

❶ Prepare for the measurement.



1. Connect the sensor to UV CHK.
2. Align the center of the LED head with the center of the light-receiving section of the UV sensor.
3. Hold down SET.
   (The AUTO mode display switches to the TYPE00 setting mode display.)

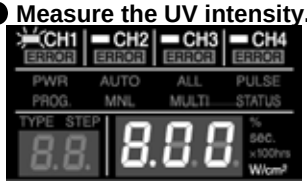
❷ Switch to setting mode.

4. Press CH1.

❸ Select CH1.

5. Press SET.
   ((The selection of CH1 will be accepted, and irradiation will be ready # (if the sensor is connected).)

❹ Measure the UV intensity.



6. Press EMISSION.
   (UV irradiation will start, and the measured value will be indicated on the display.)

❺ End the measurement.

7. Press EMISSION.
   (Irradiation will stop.)

7 How to manually calibrate the UV intensity (e.g. CH1)

You can calibrate the UV intensity set for the simple mode program based on the measured intensity.

❶ Measure the UV intensity and calibrate it.

1. Follow procedures 6-(1) to (4) to measure the UV intensity, and then calibrate it by pressing ▼ and ▲.
   (The calibrated UV intensity will be displayed.)

❷ End the calibration.

2. Press SET.
   (To accept the calibrated UV intensity level and stop irradiation)
3. Hold down SET.
   (To save the UV intensity level of CH1 in memory and go back to AUTO mode)

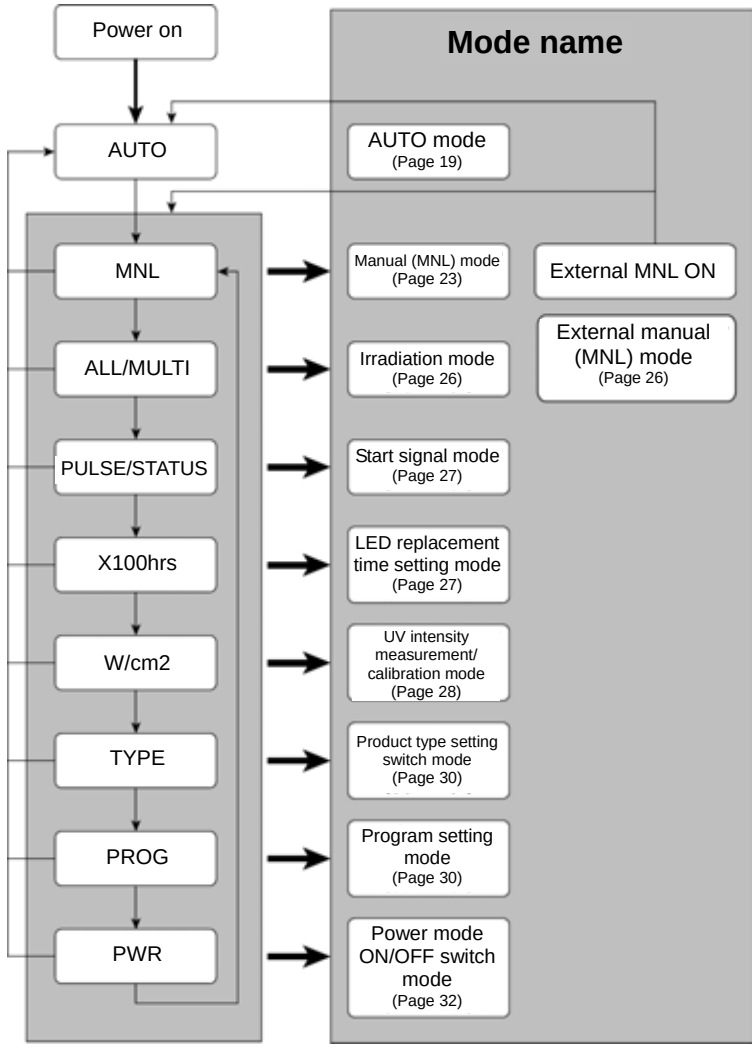
■ Operation flowchart

Mode switching operation table

Controller panel display	Mode name	How to switch from AUTO mode
AUTO	AUTO mode	Set by default when the power is turned on
MNL	*1Manual (MNL) mode (EMISSION start)	Hold down MODE switch.
MNL flashing	*2External manual (MNL) mode (External start)	Turn on the signal to INPUT terminal “MNL ON” on the rear panel. (Cannot be switched to another mode while MNL is flashing.)
ALL/MULTI	Irradiation mode	MNL mode + One press of MODE switch
PULSE/STATUS	Start signal mode	MNL mode + Two presses of MODE switch
X100hs	LED replacement time setting mode	MNL mode + Three presses of MODE switch
W/cm^2	UV intensity measurement/calibration mode	MNL mode + Four presses of MODE switch
TYPE	Product type setting switch mode	MNL mode + Five presses of MODE switch
PROG	Program setting mode	MNL mode + Six presses of MODE switch
PWR	Power mode ON/OFF switch mode	MNL mode + Seven presses of MODE switch

*1 In manual mode (EMISSION start), it is possible to externally start irradiation by turning on the external signal to “MNL ON”. (MNL indicator will be turned on.)
*2 In external manual mode (external start), it is possible to start irradiation by pressing EMISSION on the controller. (MNL indicator will flash.)

Flowchart



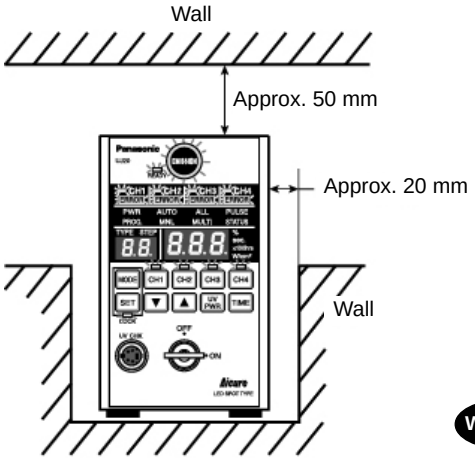
4 Installation

Install the ANUJ5024 Aicure under the conditions below.

4.1 Installation conditions

1) Ambient temp.: Main unit: 0 to 35°C
   Head: 5°C to 35°C
2) Relative humidity: No greater than 85%, with no condensation
3) Make sure the rubber legs are set horizontally parallel.
4) In order to avoid damage due to overheating, do not use if the area around the system is blocked.
5) The dimensions of the main unit are 80 mm (L) x 130 mm (H) x 145 mm (D), but you should take into account the state of the unit with an LED head attached.
   The minimum allowable bending radius for the LED head cord is 33 mm. Using the cord with a curve radius of less than 33 mm could damage it.

Warning Do not place items on top of the main unit, or block its air vents. Excessive heat could damage the unit due to overheating.



Secure enough space above and on the sides of the controller.

Warning

When using more than one controller, do not bundle the supplied AC adapters together. The AC adapters may overheat and damage the products.

Warning

***The power cable supplied with this product is a 100VAC cable for use in Japan only. When using this product outside Japan, use a power cable that has been certificated by applicable standards and has a plug shape that fits the receptable used in each country.**

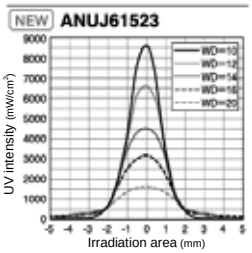
4.2 General guide for irradiation distance and UV intensity

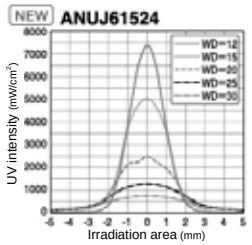
Mount the LED head on the jig so that the irradiation distance is in accordance with the size of the area to be irradiated (irradiation diameter) and the required UV intensity. Below is a general guide for irradiation distance (WD) and UV intensity.

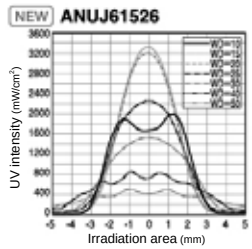
■ UV intensity data (Typical characteristics)

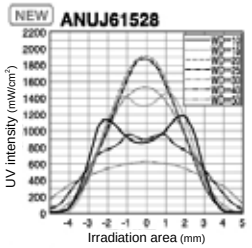
High power head: ANUJ6150

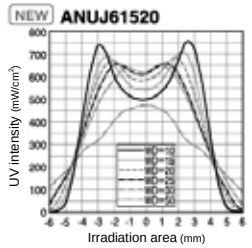
Power mode



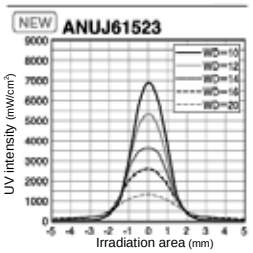


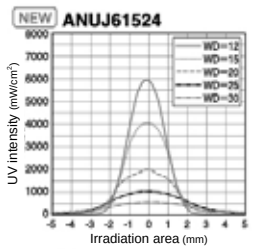


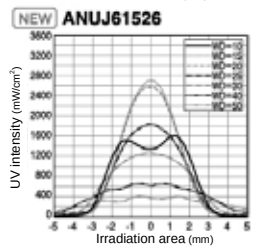


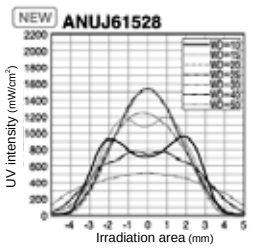


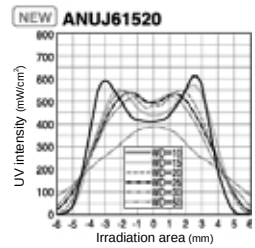
Feedback mode





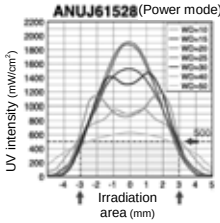






Irradiation distance vs intensity and area

If an irradiation area of 6 mm diameter is irradiated at an intensity of 500 mW/cm^2 or higher, draw lines on the graph at ±3 mm and 500 mW/cm^2. Find the irradiation distance line that covers the area surrounded by the drawn lines. In this example, the ANUJ61528 head can maintain an intensity of 500 mW/cm^2 or higher for a 6-mm diameter area (in the power mode) by setting the irradiation distance to 40 mm.



[UV intensity level: 100% Room temperature: 25°C With a cooling device attached]

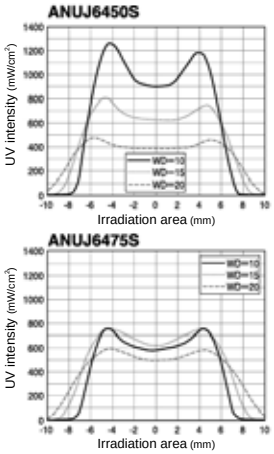
* See page 15 for the dimensions of the cooling device.

■ Cylindrical lens data (Typical characteristics)

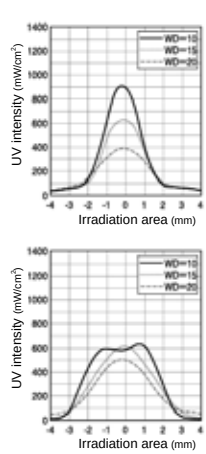
High power head: ANUJ6150

Power mode

Length direction

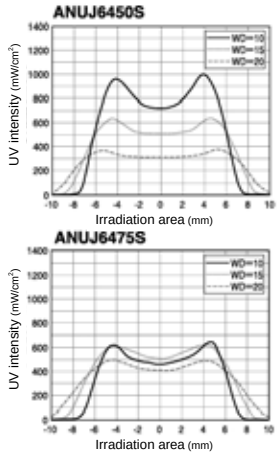


Width direction

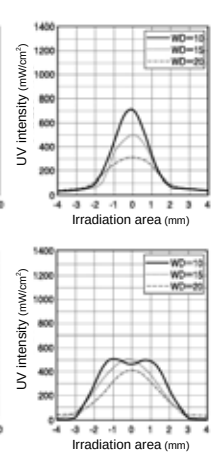


Feedback mode

Length direction



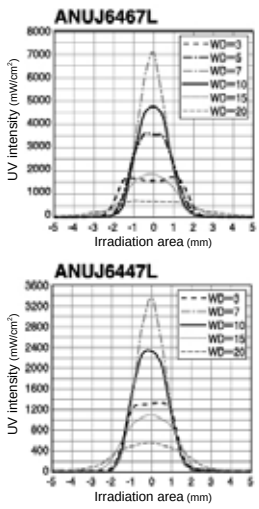
Width direction



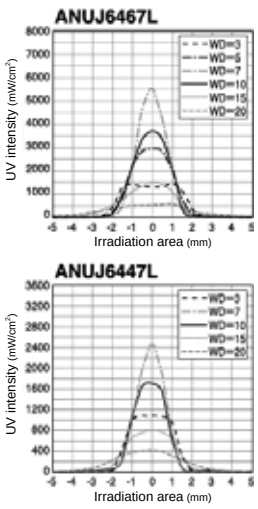
■ Rod lens data (Typical characteristics)

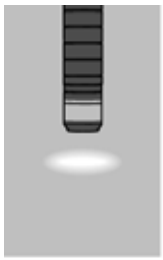
High power head: ANUJ6150

Power mode

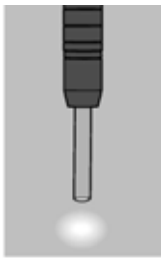


Feedback mode





Cylindrical lens



Rod lens

5 Getting started

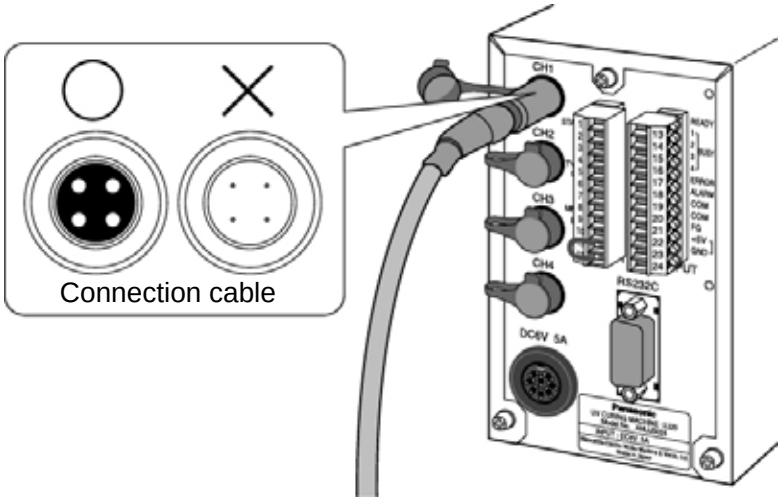
After connecting the necessary cords, lastly plug in the power cord.
This section describes the steps up to turning on the power.

5.1 Hooking up the connection cable

Remove the caps on the connection-cable terminals, and hook up the cables.

LED1	White
LED2	Red
LED3	Blue
LED4	Green

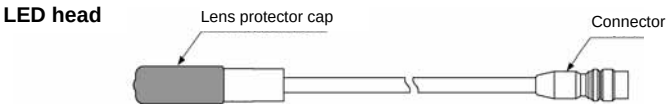
Note: Cable labels are affixed to the main unit. Please use them if you want to identify the cables.



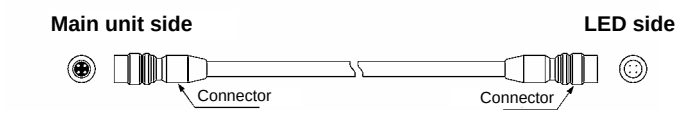
Warning Plug the female side of the connection cable into the main unit. Plugging in the wrong side (the male connector) could bend the connector pins or cause other issues.

5.2 Connecting the LED

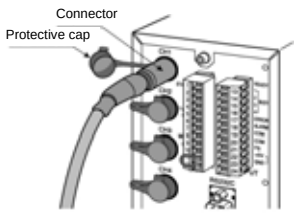
Connecting the head



Connection cable

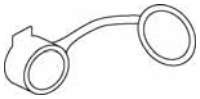


Rear panel



<Procedure>

1 Remove the protective cap on the main unit



2 Plug in the connection cable.

3 Plug the connection cable into the LED head.

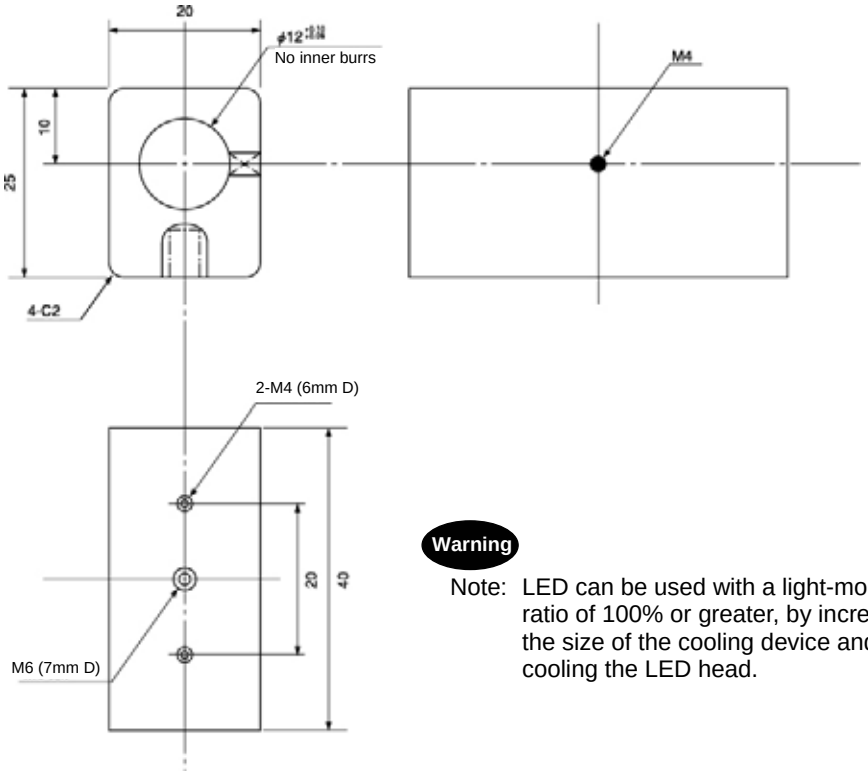
4 Remove the protective cap on the LED head.

Set the LED jig in place.

Warning

Note: The LED head is made of aluminum. Care is required, because if you tighten it directly with set screws using too much strength when it is secured in a jig, you may cause it to deform.

Reference: Cooling device (aluminum)
(100% output 15 sec ON – 15 sec OFF)



Warning

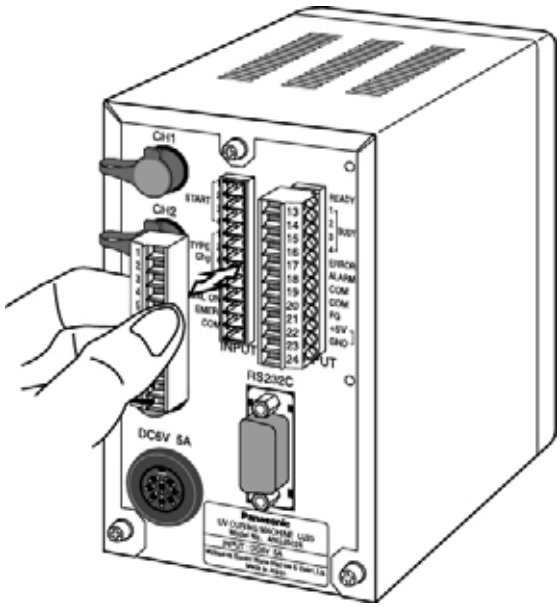
Note: LED can be used with a light-modulation ratio of 100% or greater, by increasing the size of the cooling device and/or cooling the LED head.

Warning

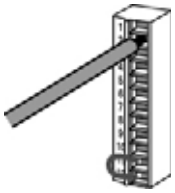
If the LED head is not mounted on a jig, the LED head can become hot during irradiation.
For this reason, do not touch it directly with your hands during irradiation.

5.3 Connecting the external control signals

The external-control connectors on the back of the main unit (two banks of 12 pins) are removable.



External control connectors (12 pins x 2)
MINI COMBICON Plug 12P (Phoenix Contact MC 1.5/12-ST-3.5)



Compatible wire (stranded)

Size	Conductor section area
AWG#24 to 16	0.2 to 1.25 mm^2

Cover stripping length

6 to 7 mm

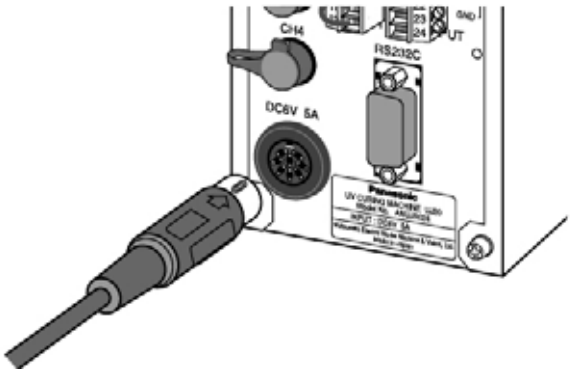
Tightening torque: 0.22 N·m to 0.25 N·m

5.4 Connection of the AC adapter

Plug the connector of the supplied AC adapter into the power socket on the rear panel. After installing the controller, connect the power plug to a receptacle.

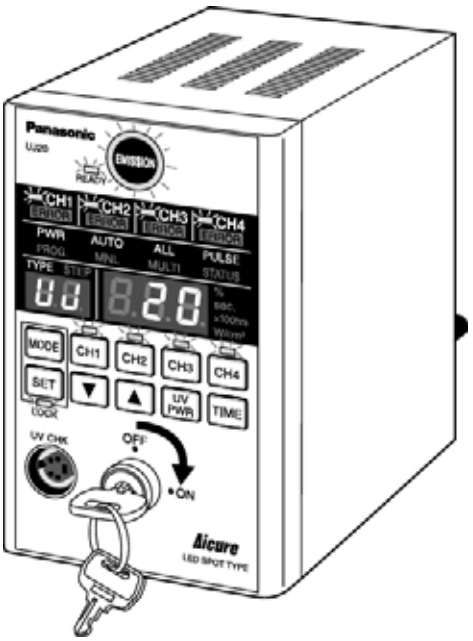
Warning

The supplied power cable is a 100 V AC cable for use in Japan only. When using this product outside Japan, use a power cable that has been certificated by applicable standards and has a plug shape that fits the receptable use in each country.



5.5 Power-on operation

Insert the supplied power key into the power switch and turn it to the right.
When the power is turned on, the startup screen will be displayed with a beeping sound, and then the AUTO mode screen (initial setting status) will be displayed.



Startup screen
UJ 20
V *.**
(Version number)

Mode	LED indicator																				Display					Unit				Switch				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
Power on																					U	J		2	0									
																						V	1	3	0									
AUTO mode																																		
Total time display																																		
Simple mode program setting																																		
Simple mode UV intensity measuring and setting																																		
MANUAL mode																																		
AUTO irradiation setting																																		
AUTO start signal setting																																		
LED replacement time setting																																		
UV intensity measuring																																		
Calibration																																		
Product type setting and switching																																		
Program setting																																		
Power mode setting																																		

(1)	EMISSION
(2)	READY
(3)	CH1
(4)	CH2
(5)	CH3
(6)	CH4
(7)	ERROR (CH1)
(8)	ERROR (CH2)
(9)	ERROR (CH3)
(10)	ERROR (CH4)

(11)	AUTO
(12)	MNL
(13)	ALL
(14)	MULTI
(15)	PULSE
(16)	STATUS
(17)	TYPE
(18)	STEP
(19)	PROG
(20)	PWR

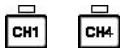
(21)	Display (2 digits)
(22)	Display (2 digits)
(23)	Display (3 digits)
(24)	Display (3 digits)
(25)	Display (3 digits)
(26)	%
(27)	sec.
(28)	x100hrs
(29)	W/cm2
(30)	LOCK

(31)	CH1 switch
(32)	CH2 switch
(33)	CH3 switch
(34)	CH4 switch

6.1 Auto mode (Set by default when the power is turned on)

■ Status check

Displays in AUTO mode

Display	Descriptions
	EMISSION switch Pressing it will start irradiation. Stays on during irradiation.
READY	Indicates that irradiation is ready to start. Stays on while irradiation is ready to start. Stays off during irradiation.
CH1 to 4 	Indicates the channel connection, irradiation operation, and temperature warning. Green: Indicates that the head is connected. Orange: Indicates a temperature warning. Red flashing: Indicates that irradiation is in progress. Flashes during irradiation, changing the flashing speed depending on the detected temperature of the LED head. Flashing speed / LED head temperature: Off — No irradiation Slow — Standard Mid — Standard ≤ Temp. < Warning level Quick — Warning level ≤ Temp. < Abnormal
ERROR	Lit when an error occurs.
PWR	Stays on while the power mode is on.
Display (2 digits)	Displays the product type no. (TYPE00 to 15) and the step no. (STEP 01 to 10).
Display (3 digits)	Displays the UV intensity level (0 to 100%), LED head temperature (0 to 999), and irradiation time (0 to 99.9, 100 to 999 sec.).
%	Stays on while the 3-digit display indicates the UV intensity level.
sec.	Stays on while the 3-digit display indicates the irradiation time.
x100hrs	Lit when the total irradiation time reaches the warning point.
CH1 to 4 switches 	Lit when the channel is selected. Lit to indicate that the channel is selected for the product type. Flashes while the 3-digit display indicates the STEP 1 data.

■ Status check

1) How to display the channel data
You can check the program (STEP 1 settings) and LED head temperature of the lit or flashing channel.

(1) Switch the display

1. The three-digit display indicates the settings or LED head temperature of the flashing channel.
2. If the channel indicator stays on, press it. It will flash, and the three-digit display will indicate the settings and LED head temperature.
3. Press UV PWR to display the UV intensity level (for STEP 1), and press it again to display the LED head temperature.
4. Press TIME to display the irradiation time (for STEP 1). (You can switch the display even during irradiation. The displayed values are saved in memory even after power-off, and the latest displayed value will appear again after power-on. Note that nothing will be displayed unless a channel is selected.)

☞ **Displays the data of the flashing channel.**

Displayed unit	Displayed value
%	UV intensity level
sec.	Irradiation time
None	LED head temperature

Warning When a temperature is displayed, no unit symbol indicator is lit. However, when a temperature warning is issued, x100hrs is turned on.

2) How to display and set the total irradiation time (x100hrs)
You can check and clear (change) the total irradiation time of each channel.

☞ **READY is off while the total irradiation time is displayed.**

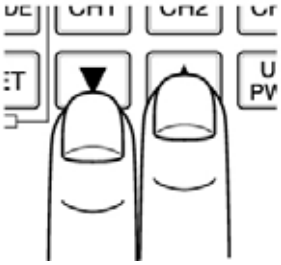
(1) Switch the display to the total irradiation time screen.

1. Hold down TIME.
(To indicate the total irradiation time of CH1 on the three-digit display)
2. Press the target channel switch.
(The total irradiation time of the channel will be indicated on the three-digit display with the channel indicator lit.)

* Go to the next step to clear/change the time.
* Press MODE to go back to AUTO mode without clearing/changing the time.

(2) Switch the channel.

(3) Clear the time.
(When replacing the LED head)



3. Press SET while the total irradiation time is displayed.
   (The total irradiation time display flashes.)
4. Press ▼ and ▲ simultaneously to reset the value to zero.
   (You can set another value by using ▼ and ▲.)
5. Press SET .
   (To accept the changed value)
   * Follow steps 1 to 5 above to clear/change the total irradiation time of the other channels.
6. Hold down SET or MODE.
   (To save the total irradiation time settings in memory and go back to AUTO mode)
   * Press MODE to cancel the change without saving it in memory and go back to AUTO mode.

* You can simultaneously accept the entered setting and save it in memory by holding down SET.
* When connecting an LED head that has been used in other equipment, you can enter its total irradiation time for LED life management.

■ Irradiation in AUTO mode

1) How to start irradiation by pressing EMISSION on the controller
   Pressing the EMISSION switch will start ALL mode irradiation in PULSE start mode regardless of the selected irradiation modes.

(1) Start irradiation.

☞ **Displays the data of the flashing channel.**

1. Press EMISSION.
   (All lit channels will start irradiation, and the EMISSION indicator will stay on during irradiation.)

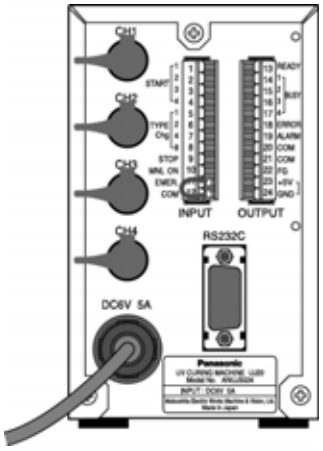
   * Irradiation will stop when all channels have completed their irradiation steps.
   * While a temperature warning is issued, x100hrs stays on.

(2) Make an emergency stop.

2. Press EMISSION again during irradiation.
   [To immediately stop irradiation of all channels (Error code E01: Irradiation uncompleted)]

2) How to start irradiation by an external signal input
Irradiation can be started by turning on the start signal input through INPUT terminals START 1 to 4 on the rear panel of the controller.

(1) Start irradiation.



1. Turn on the start signal.
(Irradiation will start under the conditions shown below.)

Mode	Start mode	INPUT terminal			
		START1	START2	START3	START4
ALL	PULSE	○	–	–	–
	STATUS	●	–	–	–
MULTI	PULSE	○	○	○	○
	STATUS	●	●	●	●

○ … Irradiation starts when the start signal is turned on.
● … Irradiation starts when the start signal is turned on, and stops when turned off. (No error is issued for incomplete irradiation.)

ALL mode: All channels selected for the product type start irradiation simultaneously when the START1 signal is turned on.
MULTI mode: The channel selected for the program starts irradiation when the START signal with a number corresponding to the channel number is turned on.

(2) Make an emergency stop.

2. Turn on the STOP signal during irradiation.
[To immediately stop irradiation (Error code E01 “Irradiation uncompleted” will be issued. Pressing EMISSION on the controller also immediately stops irradiation.)]

6.2 Manual (MNL) mode

Hold down MODE to switch to the setting mode. Hold down MODE again to return to AUTO mode. You can also switch the mode to MNL by turning on the external MNL ON signal while the controller is in AUTO mode. (When the mode is switched by the external signal, the MNL indicator will flash.)

☞ **Displays the data of the flashing channel.**

Displays in MNL mode

Display	Descriptions
	EMISSION switch Pressing it will start irradiation. Stays on during irradiation.
READY	Indicates that irradiation is ready to start. Stays on while irradiation is ready to start. Stays off during irradiation.
CH1 to 4 CH1 CH4	Indicates the channel connection, irradiation operation, and temperature warning. Green: Indicates that the head is connected. Orange: Indicates a temperature warning. Red flashing: Indicates that irradiation is in progress. Flashes during irradiation, changing the flashing speed depending on the detected temperature of the LED head.
ERROR	Lit when an error occurs.
PWR	Stays on while the power mode is on.
Display (3 digits)	Displays the UV intensity level (0 to 100%), LED head temperature (0 to 999), and irradiation time (0 to 99.9, 100 to 999 sec.).
%	Stays on while the 3-digit display indicates the UV intensity level.
sec.	Stays on while the 3-digit display indicates the irradiation time.
x100hrs	Lit when the total irradiation time reaches the warning point.
CH1 to 4 switches CH1 CH4	Lit when the channel is selected. (You can select the channels with an LED head connected.)

Flashing speed	LED head temperature
Off	No irradiation
Slow	Standard
Mid	Standard ≤ Temp. < Warning level
Quick	Warning level ≤ Temp. < Abnormal

Operation modes

■ Operation

1) How to display the channel data

You can check channel data with an LED head connected (UV intensity level, irradiation time, and LED head temperature).

(1) Switch to MNL mode.
(2) Switch the displayed channel.

☞ **Displays the data of the flashing channel**

☞ **You can select the channels with an LED head connected**

1. Hold down MODE.
   (The MNL indicator will be turned on.)
2. Press the target channel switch with an LED head connected.
   (The channel switch indicator will flash, and the three-digit display will indicate the channel data.)
3. Press UV PWR.
   (The UV intensity level and the LED head temperature will be displayed.)
4. Press TIME.
   (The irradiation time will be displayed.)

*The displayed irradiation time is the manual irradiation time. Switch the mode or power off the controller to turn off the time display.

*The latest setting of the UV intensity level is saved in memory.

*You can switch the display even during irradiation. The displayed values are saved in memory even after power-off, and the latest displayed value will appear again after power-on. Note that nothing will be displayed unless a channel is selected.)

Displayed unit	Displayed value
%	UV intensity level
sec.	Irradiation time
None	LED head temperature

Warning

When a temperature is displayed, no unit symbol indicator is lit. However, when a temperature warning is issued, x100hrs is turned on.

2) How to change channel data with an LED head connected

You can change the channel data with an LED head connected.

(1) Switch to MNL mode.
(2) Select the channel.

1. Hold down MODE.
2. Press the target channel switch with an LED head connected.
   (The channel will be selected with its indicator flashing, and the three-digit display will indicate the channel data.)

(3) Clear the channel selection.

3. Press the flashing channel switch.
(The channel selection will be cleared, and the channel switch indicator will be turned off.)

(4) Set the UV intensity level.

4. Press UV PWR to go to the UV intensity level screen with the % indicator lit.
5. Press ▼ and ▲ to adjust the intensity level.
(The displayed UV intensity level will flash.)

☞ **Displays the data of the flashing channel.**

6. Press SET.
(The UV intensity level setting will be accepted, and the display will stay on.)

* You can change the intensity level even during irradiation.

■ Irradiation in MNL mode

1) How to start irradiation by pressing EMISSION on the controller
Hold down MODE to switch to the setting mode. Press EMISSION, and all selected channels will start irradiation simultaneously. The EMISSION indicator stays on during irradiation.
Press EMISSION during irradiation, and all channels will stop irradiation.

(1) Switch to MNL mode.
(2) Select the channel.
(3) Set the UV intensity level.

1. Hold down MODE.
2. Press the channel switch.
3. Press ▼ and ▲ to adjust the intensity level.
4. Press SET.

(4) Start irradiation.

5. Press EMISSION.
(All lit channels will start irradiation, and the EMISSION indicator will stay on during irradiation.)

☞ **Displays the data of the flashing channel.**

(5) Stop irradiation.

6. Press EMISSION during irradiation.
(All channels will stop irradiation.)

* While a temperature warning is issued, x100hrs stays on.
* While one or more channels are in the midst of the irradiation process, you can start irradiation of the other channels with an LED connected that is not in irradiation process by turning on the switch of the channel. In this case, the irradiation time display is cleared and newly counted every time irradiation starts.
* Irradiation by individuals channels can be stopped by pressing the flashing channel switch again (whose data is displayed).
* When all channels stop irradiation, the EMISSION indicator is turned off.

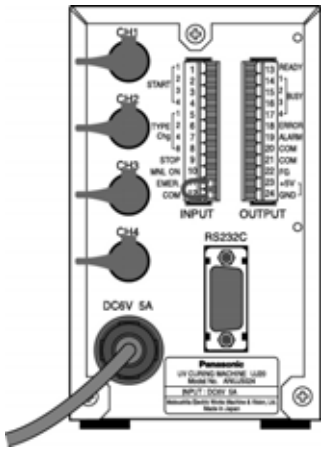
2) How to start MNL irradiation by an external signal input
Irradiation can be started by turning on the start signal input through INPUT terminals START 1 to 4 on the rear panel of the controller.

(1) Switch to external MNL mode.

1. Turn on the signal input to INPUT terminal “MNL ON” on the rear panel of the controller.
(The MNL indicator will flash.)

(2) Start irradiation.

2. Turn on the signal input to the START terminal with the number corresponding to the target channel number.
(Irradiation will start. The EMISSION indicator on the controller stays on during irradiation.)



(3) Stop irradiation.

3. Turn off the signal to the START terminal for the irradiating channel.
(Irradiation will stop.)

* While a temperature warning is issued, x100hrs stays on.
* Switching to the external MNL mode is only available from the AUTO or MNL mode.
* When the MNL ON signal is turned off, the controller will return to the previous mode (AUTO or MNL).
* When the MNL ON signal is turned on in AUTO mode to switch to external MNL mode, the MNL indicator will flash.

6.3 Irradiation mode (ALL/MULTI)

Press MODE once in MNL mode to go to the irradiation mode setting screen.
The current mode indicator will be turned on.

■ Setting

(1) Switch the mode.

1. Press SET.
(To switch between ALL and MULTI)

* Available in AUTO mode.
* ALL mode: All channels are selected simultaneously for the product type start irradiation when the START1 signal is turned on.
* MULTI mode: The channel selected for the program starts irradiation when the START signal with a number corresponding to the channel number is turned on.

☞ Pressing the EMISSION switch on the controller will always start ALL mode irradiation in PULSE start mode.

6.4 Start signal mode (PULSE/STATUS)

Press MODE twice in MNL mode to go to the start signal mode setting screen.
The current mode indicator will be turned on.

■ Setting

(1) Switch the mode.

1. Press SET.
   (To switch between PULSE and STATUS)
   * Available in AUTO mode.
   * PULSE mode: Irradiation starts when the start signal is turned on. (Pulse width: 100 ms or more)
   * STATUS mode: Irradiation starts when the start signal is turned on, and stops when turned off.

☞ Pressing the EMISSION switch on the controller will always start ALL mode irradiation in PULSE start mode.

6.5 LED replacement time (x100hrs) setting mode

Press MODE three times in MNL mode to go to the LED replacement time setting screen. Then press SET to display the current replacement time setting.

■ Setting

(1) Set the LED replacement time

1. Press SET.
   (The LED replacement time setting will be displayed.)
2. Press ▼ and ▲ to change the setting.
   (The display flashes during the changing operation.)
3. Press SET.
   (The setting will be accepted, and the display will stay on.)
4. Hold down SET.
   (To save the setting in memory, clear the display, and return to the top of the setting screen)

* Press MODE to cancel the change without saving it in memory and return to the top of the setting screen.
* You can simultaneously accept the entered setting and save it in memory by holding down SET rather than pressing it in step 3 above.

6.6 UV intensity (W/cm^2) measurement/calibration mode

Press MODE four times in MNL mode to go to the UV intensity measurement/calibration mode setting screen. In this mode, you can check the UV intensity of the LED heads connected to the controller channels and calibrate the intensity programmed for each TYPE or STEP.

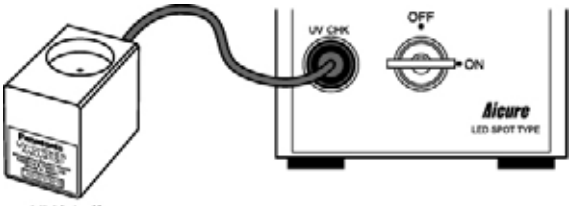
* This mode requires a dedicated optional UV sensor.

■ Setting

1) How to measure the UV intensity

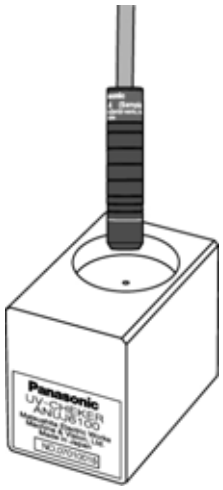
(1) Connect the UV sensor.

1. Press SET.
   (Without the sensor connected, 000 will flash, and with it connected, 0 will be displayed.)



UV Sensor

(2) Measure the UV intensity.



2. Connect the target LED head.
3. Press the channel switch for the target LED head.
4. Press EMISSION.
   (UV irradiation will start, and the measured value will be indicated on the three-digit display.)
5. Press EMISSION during irradiation.
   (Irradiation will stop.)

* Press ▼ and ▲ during irradiation to change the intensity level.
* Pressing UV PWR switches between the displays in W/cm^2 and % alternately.

2) How to calibrate the UV intensity

(1) Switch to the calibration mode.

1. Connect the UV sensor.
2. Hold down SET.
(The two-digit display will flash.)
3. Press ▼ and ▲ to select the target TYPE number.
4. Press SET.
(To accept the TYPE number and go to the STEP setting screen.)
5. Press ▼ and ▲ to select the target STEP number.
6. Press SET.
(To accept the STEP number and go to the UV intensity setting screen.)
7. Press ▼ and ▲ to select the target UV intensity (W/cm2).
8. Press SET.
(The target UV intensity setting will be accepted, and the display will stay on.)
9. Press the channel switch for the LED head to be calibrated.

(2) Start calibration.

10. Press EMISSION.
(Irradiation will automatically start and stop after completion.)

* The measured intensity (W/cm2) and the intensity level (%) are displayed alternately during calibration.
* When calibration has completed, the measured intensity after calibration (W/cm2) will be displayed. Pressing UV PWR will alternately display the target UV intensity (W/cm2) and the intensity level after calibration (%).
* Pressing EMISSION again during irradiation will stop irradiation, issuing error E07.

(3) End calibration.

11. Press SET.
(To accept and set the calibrated value for the program)

* You can continue to calibrate the intensity for the other TYPE number.
* Hold down SET to save the calibrated value in memory and return to the UV intensity measurement/calibration (W/cm2) mode.
* Press MODE to cancel all data and return to the UV intensity measurement/calibration (W/cm2) mode.

6.7 Product type (TYPE) switching mode

Press MODE five times in MNL mode to go to the product type (TYPE) switching screen. Then press SET to display the current product type and channel selections. In this mode, you can switch the product type and channel selections.

(1) Switch TYPE.

1. Press SET.
   (To display the current type and channel selections)
2. Press ▼ and ▲ to select the target product type.
   (The two-digit display and channel switch will flash.)
3. Select the target channel switch.
   (Press the lit or flashing channel switch to cancel the selection.)
4. Press SET.
   (To accept the product type and channel selections.)

* You can change the channel selection by pressing the target channel switch.
Press SET to accept the channel selection change.
* Hold down SET to save the selection in memory and return to the product type switching screen.
* Press MODE to cancel the change and return to the product type switching screen.

6.8 Program (PROG) setting mode

Press MODE six times in MNL mode to go to the program (PROG) setting screen. Then press SET to display the current product type and channel selections. In this mode, you can set up to ten AUTO irradiation program steps (STEP 1 to 10) for each channel for each product type. (Only STEP 1 can be set for TYPE 00.)

(1) Select TYPE.

1. Press SET.
   (To display the current type and channel selections)
2. Press ▼ and ▲ to select the target product type.
   (The two-digit display will flash.)
3. Press the switch of the channel to be programmed.
   * When selecting two or more channels, press two or more channel switches simultaneously.
4. Press SET.
   (To accept the type and channel selections and go to the STEP setting screen.)

(2) Select the channel.
(3) Set a program.

5. Press ▼ and ▲ to set the UV intensity level.
   (The three-digit display will flash.)
6. Press SET.
   (To accept the UV intensity level for STEP 01 and go to the irradiation time setting screen.)
7. Press ▼ and ▲ to set the irradiation time.
   (The three-digit display will flash.)
8. Press SET.
   (To accept the irradiation time for STEP 01 and go to the STEP 02 setting screen.)

* When you finish programming STEP 01 to 10 by following 5 to 8 above, program setting for the other channels will be available. Start from the channel selection step and follow the same procedures.
* Hold down SET to save all entered programs in memory.
* Press MODE to cancel the changes without saving them in memory and return to the program setting screen.
* If AUTO irradiation does not require all ten program steps, set the irradiation time for the next step of the last required step to "0 sec." to end the program setting without going to the next step and go back to the top of the program setting screen. (For example, when only STEP 1 and 2 need to be programmed, set the irradiation time for STEP 3 to "0 sec." With this setting, AUTO irradiation will end after completing STEP 2.)
* If you hold down SET during the program setting, all entered data will be accepted and saved in memory simultaneously.

Program table

TYPE		STEP1		STEP2		STEP3		STEP4		STEP5		STEP6		STEP7		STEP8		STEP9		STEP10	
		%	sec	%	sec	%	sec	%	sec	%	sec	%	sec	%	sec	%	sec	%	sec	%	sec
00	CH1																				
	CH2					Only STEP 1 can be set for TYPE 00 (Simple mode).															
	CH3																				
	CH4																				
01	CH1																				
	CH2																				
	CH3																				
	CH4																				
⟆																					
15	CH1																				
	CH2																				
	CH3																				
	CH4																				

6.9 Power (PWR) mode

Press MODE seven times in MNL mode to go to power (PWR) mode setting screen. Then press SET to display the current setting.

* Power mode can be turned on/off in AUTO or MNL mode.

(1) Switch the setting.

1. Press SET.
   (To switch between PWR ON and OFF.)

The three-digit display indicates
 * “ON” when power mode is turned on
 * “OFF” when power mode is turned off

6.10 Setting lock function

You can lock the settings by holding down ▼ and ▲ simultaneously in AUTO mode (power-on default mode).

While the settings are locked, the LOCK indicator stays on.

Unavailable operations
- Mode switching
  - MNL mode, operation mode, start mode,
  - LED replacement time setting, UV CHK mode, TYPE setting,
  - PROG setting, and PWR mode setting
- Total irradiation time changing

Available operations
- Total irradiation time display
- TYPE switching by an external signal input
- NNL operation by an external signal input
- All operations by communications with a PC

 * Hold down ▼ and ▲ simultaneously again to release the lock.

6.11 Irradiation mode setting

■ ALL irradiation mode (batch irradiation)

Requirements for the READY signal to be on

(1) The programs of all channels selected for the target product type must be ready for irradiation.
- The STEP 01 time of the programs of all channels selected for the target product type must not be set to “0 sec.”

(2) The controller must be in AUTO mode (power-on default mode).
(3) LED heads must be connected to all channels selected for the target product type.
(4) The target channels must not be in the midst of the irradiation process. (The BUSY signals of the target channels must be off.)
(5) The interlock must be functioning. [INPUT connectors (11) and (12)]
When all of the above requirements are met, irradiation is possible, and the READY signal will be on.

Irradiation start

When the READY signal is on, press EMISSION or input the following external signal to start irradiation.

(1) PULSE (pulse start) mode:
: The LED heads connected to all channels selected for the target product type start irradiation at the leading edge of external signal “START 1” (100 ms or more) simultaneously.

(2) STATUS (status start) mode:
: The LED heads connected to all channels selected for the target product type start irradiation when external signal “START 1” is turned on, and stop irradiation when the signal is turned off.

Emergency stop/Stop during irradiation

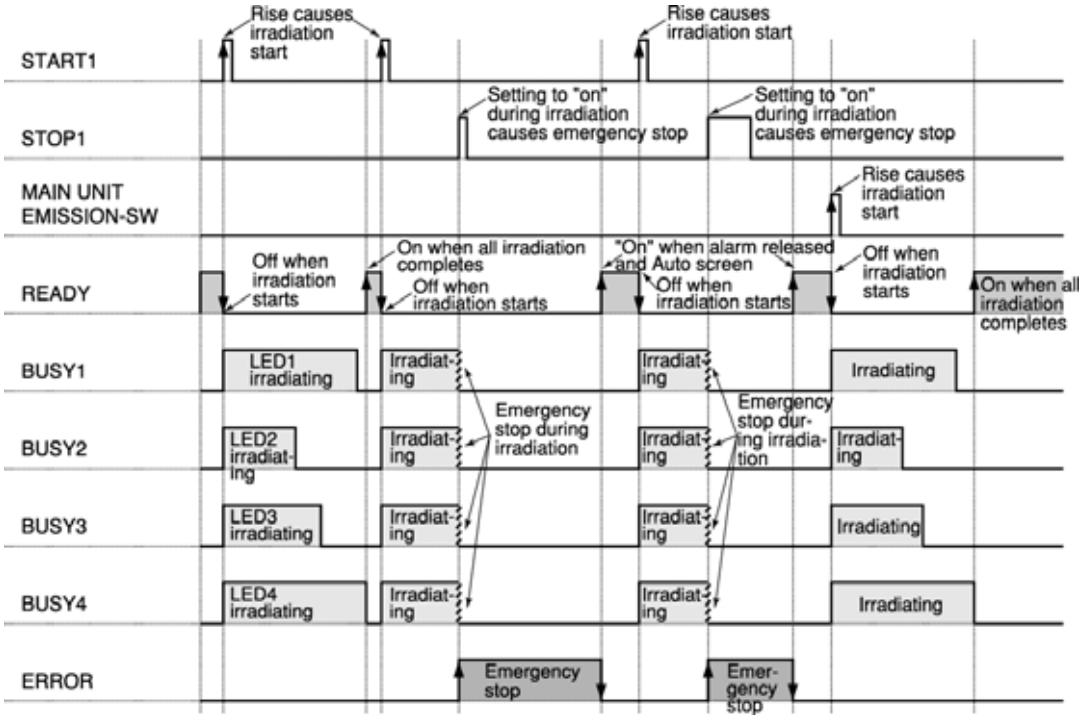
Turn off (open) the external signal interlock and turn on the emergency stop signal, or control the external signal as shown below, to immediately stop irradiation.

(1) PULSE (pulse start) mode:
: Press EMISSION during irradiation to make an emergency stop.
: The ON/OFF status of other start signals START 2, 3, and 4 is ignored.

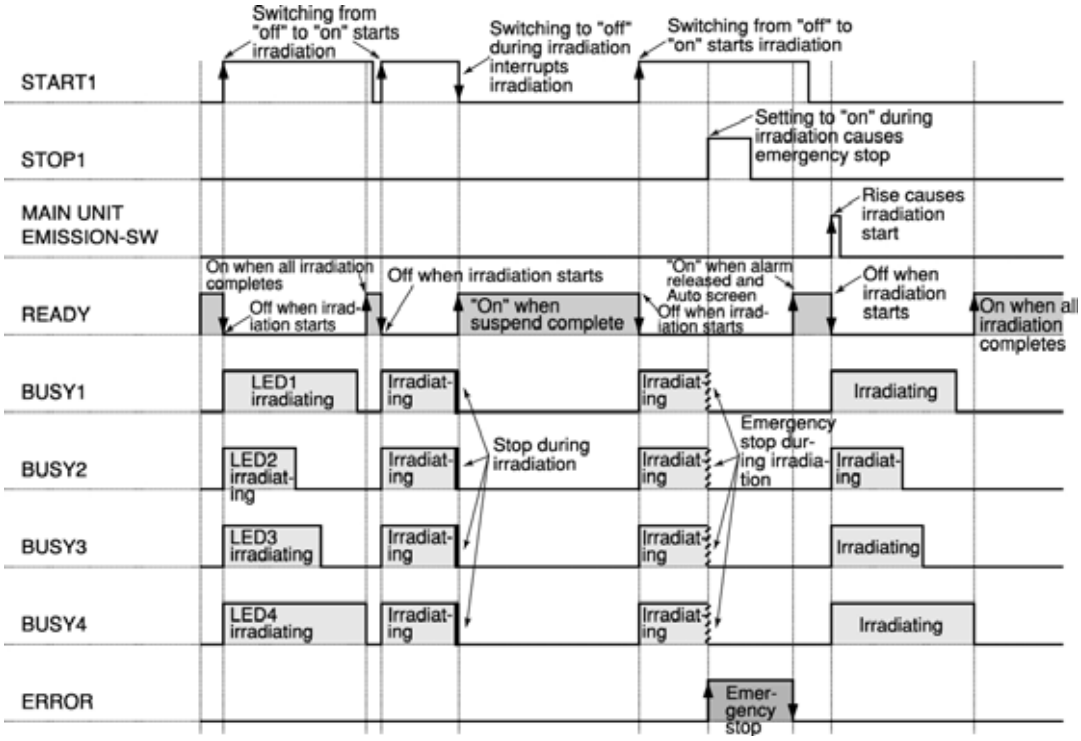
(2) STATUS (status start) mode:
: When START 1 is turned off during irradiation, irradiation will be stopped (with no error issued).
: Press EMISSION during irradiation to make an emergency stop.
: The ON/OFF status of other start signals START 2, 3, and 4 is ignored.

Operation modes

Time chart of ALL-PULSE mode (batch irradiation in pulse start mode)
START 2 to 4 do not operate.



Time chart of ALL-STATUS mode (batch irradiation in status start mode)
START 2 to 4 do not operate.



■ MULTI irradiation mode (individual irradiation)

Requirements for the READY signal to be on

(1) The program of the channel selected for the target product type must be ready for irradiation.
  - The STEP 01 time of the program of the channel selected for the target product type must not be set to “0 sec.”

(2) The controller must be in AUTO mode (power-on default mode).
(3) An LED head must be connected to at least one channel selected for the target product type.
(4) The target channel must not be in the midst of the irradiation process. (The BUSY signal of the target channel must be off.)
(5) The interlock must be functioning. [INPUT connectors (11) and (12)]
When all the above requirements are met, irradiation is possible, and the READY signal is on.

Irradiation start

When the READY signal is on, press EMISSION to have all ready LEDs start irradiation simultaneously. Input the following external signal to have the LEDs start irradiation individually. Channels whose STEP 01 time is set to “0 sec.” will not start irradiation.

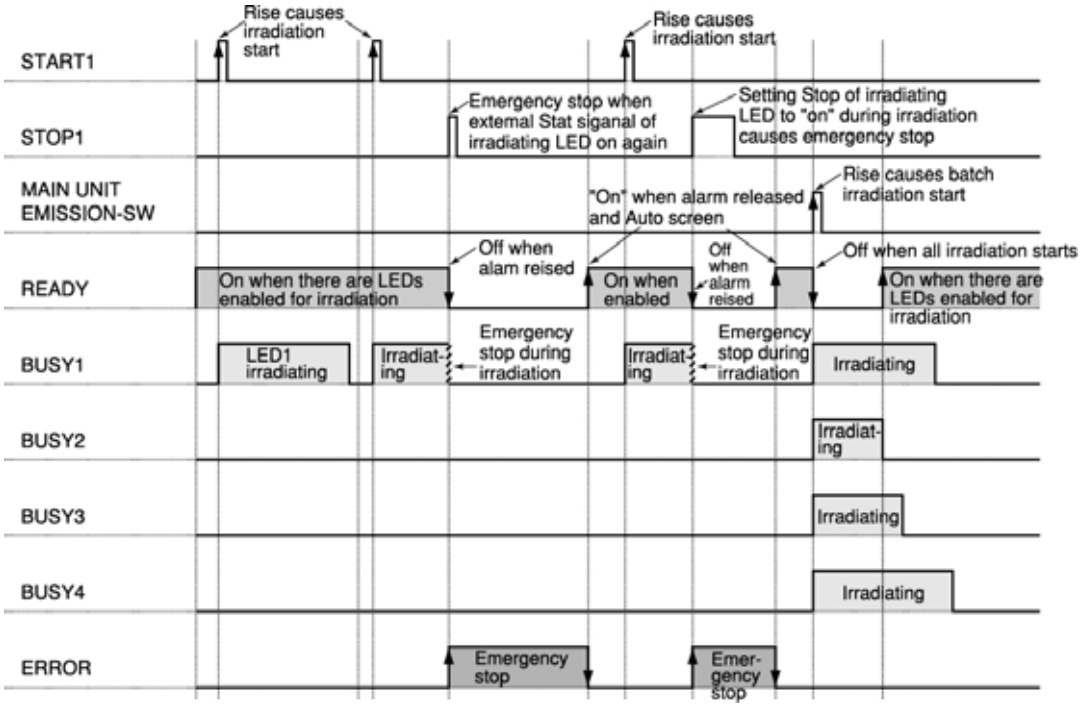
(1) PULSE (pulse start) mode:
  : The LED heads connected to the channels selected for the target product type individually start irradiation at the leading edge of each external signal “START 1/2/3/4” (100 ms or more).
(2) STATUS (status start) mode:
  : The LED heads connected to the channels selected for the target product type individually start irradiation when each external signal START 1/2/3/4 is turned on. When it is turned off, the corresponding channel stops irradiation.

Emergency stop/Stop during irradiation

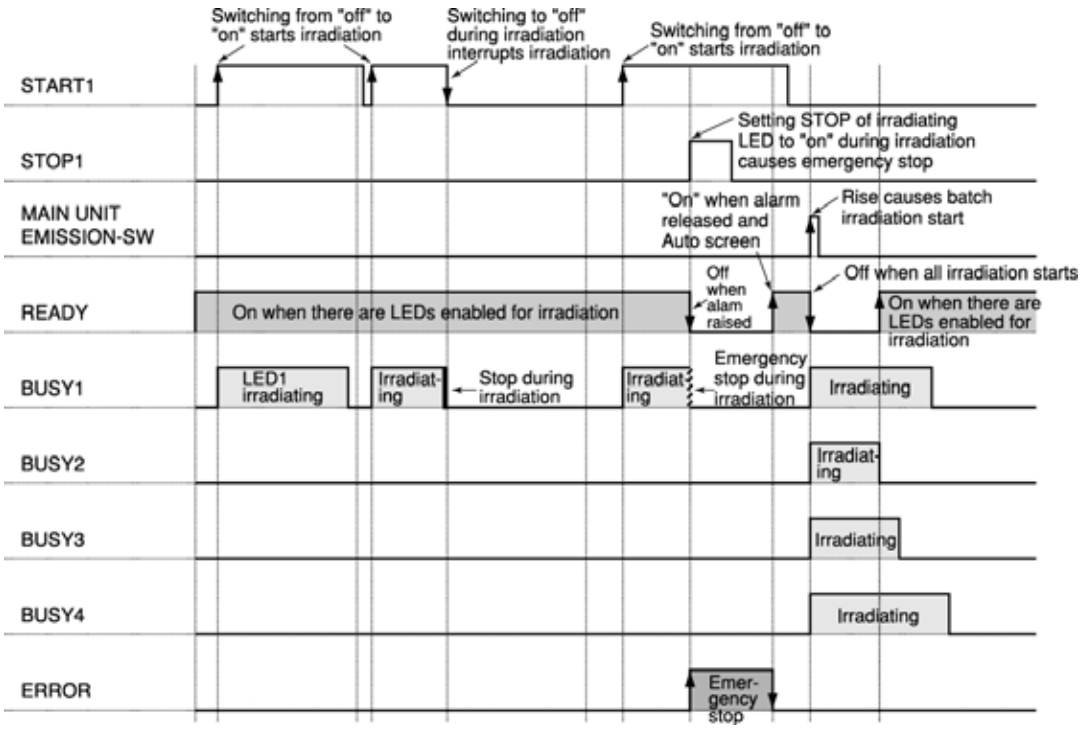
Turn off (open) the external signal interlock and turn on the emergency stop signal or control the external signal as shown below to immediately stop irradiation.

(1) PULSE (pulse start) mode:
  : Press EMISSION during irradiation to make an emergency stop.
(2) STATUS (status start) mode:
  : When external START signal for the irradiating LED is turned off, irradiation will be stopped (with no error issued).
  : Press EMISSION during irradiation to make an emergency stop.

Time chart of MULTI-PULSE mode (individual irradiation in pulse start mode)
The channels individually start irradiation by turning on START 1 to 4 respectively.



Time chart of MULTI-STATUS mode (individual irradiation in status start mode)
The channels individually start irradiation by turning on START 1 to 4 respectively.



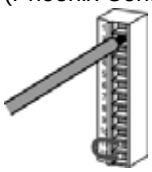
7 External control

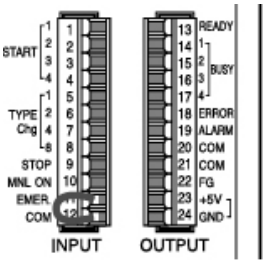
7.1 External input/output control

■ External control connectors (12 pins x 2)

MINI COMBICON Plug 12P

(Phoenix Contact MC 1.5/12-ST-3.5)

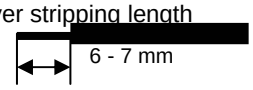




Compatible wire (stranded)

Size	Conductor section area
AWG#24 to 16	0.2 to 1.25 mm^2

Cover stripping length



Warning

Tightening torque: 0.22 N·m to 0.25 N·m

Precautions for wiring

- Carefully strip the cover so as not to damage the core wires.
- Connect the core wires without twisting them.
- Connect the core wires without soldering them; otherwise, they may break due to vibration.
- After connection, do not apply stress to the cable.
- Because of the terminal structure, if the wire is tightened by a counterclockwise rotation, the connection will fail. In such cases, pull out the wire, check the terminal hole, and then connect it again.

■ Input/Output terminal table

INPUT

Pin No.	Signal name	Descriptions
1	START 1	CH1 or batch irradiation start signal
2	START 2	CH2 irradiation start signal
3	START 3	CH3 irradiation start signal
4	START 4	CH4 irradiation start signal
5	TYPE Chg1	Product type switching signal
6	TYPE Chg2	Product type switching signal
7	TYPE Chg4	Product type switching signal
8	TYPE Chg8	Product type switching signal
9	STOP	Emergency irradiation stop signal
10	MNL ON	Manual mode switch signal (External MNL mode)
11	EMER.	Interlock (normally ON)
12	COM	Common terminal for input/output signals

OUTPUT

Pin No.	Signal name	Descriptions
13	READY	ON when irradiation is ready to start
14	BUSY 1	ON during CH1 irradiation
15	BUSY 2	ON during CH2 irradiation
16	BUSY 3	ON during CH3 irradiation
17	BUSY 4	ON during CH4 irradiation
18	ERROR	Error signal
19	ALARM	Warning signal (temperature/time warning)
20	COM	Common terminal for input/output signals
21	COM	Common terminal for input/output signals
22	FG	Frame ground
23	+5V	5 V DC output (for display or output signals)
24	GND	5 V DC ground

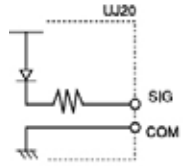
Warning The ON time of the input signal pulses must be 100 ms or more.

■ Product type switch table

TYPE No.	Pin No. 8	Pin No. 7	Pin No. 6	Pin No. 5	Remarks
00	off	off	off	off	All off: Controller operation has priority.
01	off	off	off	on	When an external signal is on, the product type set by the external signal has priority.
02	off	off	on	off	
03	off	off	on	on	
04	off	on	off	off	
05	off	on	off	on	
06	off	on	on	off	
07	off	on	on	on	
08	on	off	off	off	
09	on	off	off	on	
10	on	off	on	off	
11	on	off	on	on	
12	on	on	off	off	
13	on	on	off	on	
14	on	on	on	off	
15	on	on	on	on	

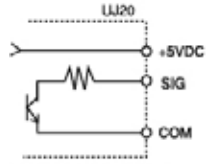
■ Control by external signals

Input specifications



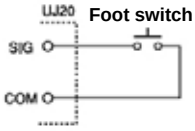
Open collector (Tr) or no-voltage input such as a relay

Output specifications

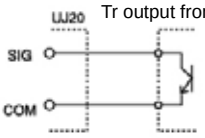


Rated operation voltage: 5 to 24 V DC
Output capacity: 100 mA (max.)

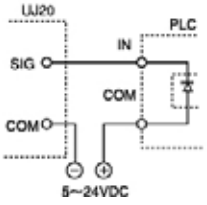
Contact input



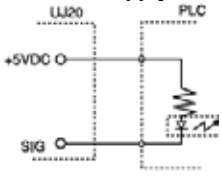
Non-contact input



With external power supply



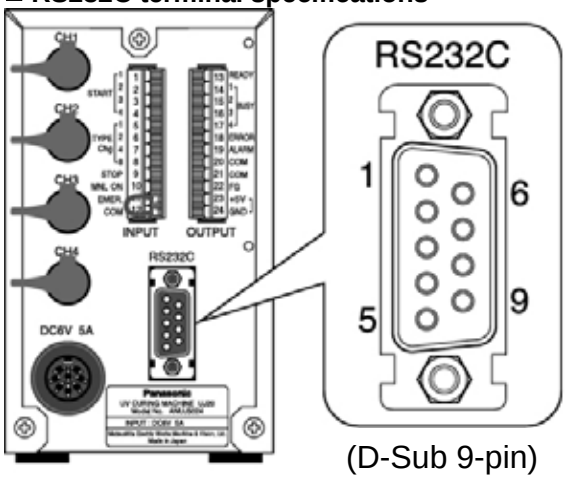
With internal power supply



Output specifications
-Rated load voltage: 5 V DC to 24 V DC
-Maximum allowable load current: 100 mA (per output)
When using the internal 5 V power supply, the maximum allowable load current is 250 mA in total.
-Maximum voltage drop in ON state: 0.9 V

7.2 Serial communication control

■ RS232C terminal specifications



(D-Sub 9-pin)

D-Sub 9-pin (male) connector (DELC-J9PAF-10L9E made by JAE)

[Connection cable specifications]

Use a D-Sub 9-pin (female) connector.

Straight cable

Signal	Abbr.	Pin No.
Not assigned	-	1
Send data	SD	2
Receive data	RD	3
Not assigned	-	4
Signal ground	SG	5
Not assigned	-	6
Not assigned	-	7
Not assigned	-	8
Not assigned	-	9

■ Communication specifications

Interface	RS232C
Communication method	Half duplex
Synchronization	Asynchronous communication method
Transmission medium	3-core shielded wire
Transmission distance	15 m max.
Transmission speed	38400bps
Transmission code	ASCII
Transmission format	Data length: 8 bits
	Parity check: None
	Stop bit: 1 bit

■ Commands and responses

- Instructions sent to the controller are called commands.
- Messages returned from the controller are called responses.
- The communications are two-way. (When a command is sent, a response is always returned.)
- Data is sent in ASCII format.

Warning

- When a response is not received, this indicates that the transmission format is wrong, the command has not yet reached its destination, or the controller is not in operation. Check the communication specifications, such as the transmission speed, data lengths, and parity.
  When a response with "!" instead of "$" stored is received, it indicates that the command has not been processed correctly. Check the communication error code stored in the response to identify the error.

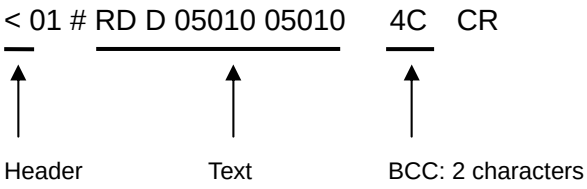
■ Control commands

Name	Character	ASCII	Descriptions
Header	<	3CH	Beginning of the message
Command	#	23H	Command message
Response (Normal)	$	24H	Normal response message
Response (Error)	!	21H	Error response message
Terminator	C_R	0DH	End of the message

■ Block check code BCC (H) (L)

Two-digit hexadecimal number: 00 to FF (ASCII)

- BCC are codes used for horizontal parity check to detect errors for improvement of the transmission data reliability.
- BCC are made up of two ASCII characters converted from eight-bit data of XOR from the header (<) to the last character of the text.

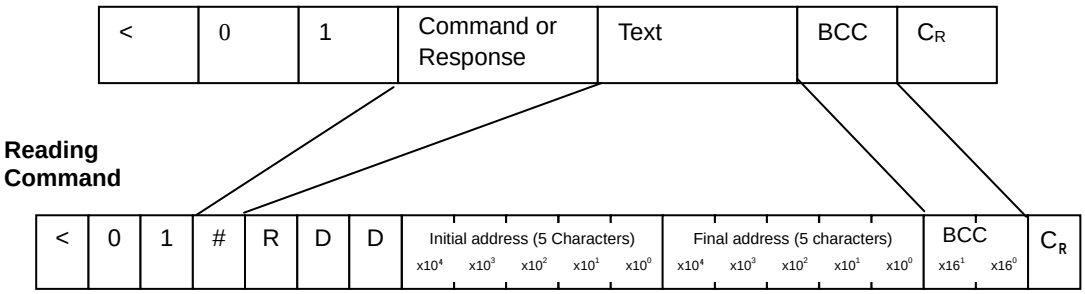


■ Error codes

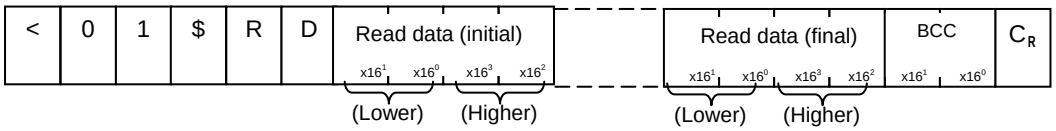
Two-digit hexadecimal number: 00 to FF (ASCII)
- When an error occurs, the codes are sent to identify the error.

Error code	Error name	Descriptions and troubleshooting
40H	BCC error	The command data caused a BCC error. <Troubleshooting> Check the BCC code and resend the data.
41H	Format error	For example, the transmission format of the command data is not correct, or the address does not exist. <Troubleshooting> Correct the format or command.
45H	Address error	The sent address was outside the range. <Troubleshooting> Check the address.

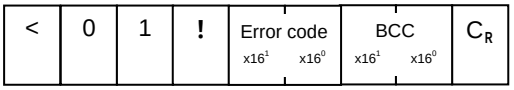
■ Command/response format


< 0 1 Command or Response Text BCC C_R
Reading Command
< 0 1 # R D D Initial address (5 Characters) $x10^4$ $x10^3$ $x10^2$ $x10^1$ $x10^0$ Final address (5 characters) $x10^4$ $x10^3$ $x10^2$ $x10^1$ $x10^0$ BCC $x16^1$ $x16^0$ C_R

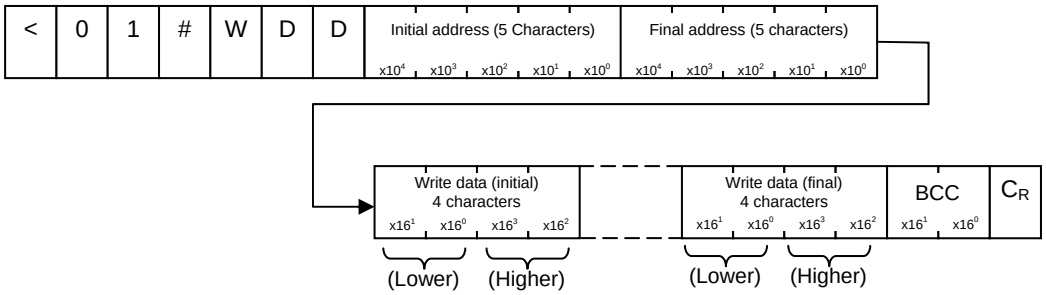
Normal response



Error response



Writing
Command



Normal response

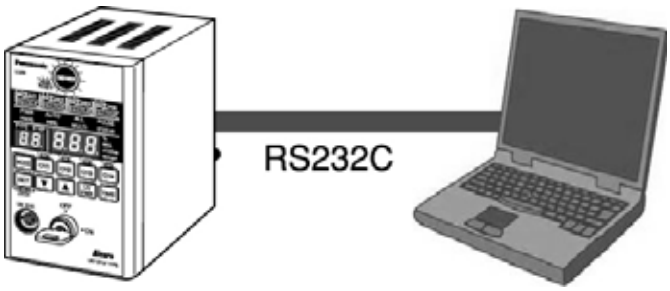
<	0	1	$	W	D	BCC $x16^1$ $x16^0$	C_R

Error response

<	0	1	!	Error code $x16^1$ $x16^0$	BCC $x16^1$ $x16^0$	C_R

■ Utility software (for control from a PC)

- Download the software from our website.
- The software is compatible with Windows XP.



8 Warning Displays

In the event of an error during irradiation, the AUTO or MNL mode screen will display a warning.

■ Temperature warning

When the LED head temperature reaches the warning level during irradiation in MNL or AUTO mode, the channel connection indicator will change to orange (mixture of green and red) and the external output signal “ALARM” will be turned on.

Temperature warning
When the measured LED head temperature reaches the warning level, the channel connection indicator will stay on and remain orange. When the temperature reaches an abnormal level, error code E05 will be displayed with a beeping sound, and external output signal ERROR will be turned on. The warning indicator will change to green when the temperature has decreased to the level where the warning is cleared. If the color does not change to green after waiting for a while, it Is possible that there is a problem with the LED temperature detection line, such as a short-circuit. Remove the LED head and the connection cable from the connector and check the wiring.

■ Time warning

When the total irradiation time reaches the warning point during irradiation in MNL or AUTO mode, unit indicator “x100hrs” will be turned on, and the external output signal ALARM will be turned on. After the time warning is issued, x100hrs always stays on until the total irradiation time is reset in AUTO or MNL mode.

Time warning
When the total irradiation time of the LED head reaches 30 hours before the LED replacement point, x100hrs will be turned on. When the time reaches the LED replacement point, error code E06 will be displayed with a beeping sound, and the external output signal ERROR will be turned on. Holding down SET will forcibly reset the error and turn off the external output signal ERROR with a beeping sound. However, the ERROR indicator will still stay on. The indicator will be turned off when the total irradiation time is reset after the LED head replacement.
If irradiation continues while the ERROR indicator stays on, error code E06 will be displayed again with a beeping sound.

* You can check which channels are under the time warning by switching the display to the total irradiation time (x100hrs) screen. If x100hrs indicator is flashing, the channel is under the time warning.

Warning Displays

■ Error codes

When an error occurs, the three-digit display will indicate the error code.

Display	Error name	Descriptions
E00	**Interlock emergency stop**	**The interlock contact was opened during irradiation.**
E01	**Irradiation incomplete**	**The irradiation was stopped before completion.**
E02	**Connection error**	**Disconnected during irradiation**
E03	**LED wire broken**	**LED circuit opening was detected during irradiation.**
E04	**LED short-circuited**	**LED short-circuiting was detected during irradiation.**
E05	**LED temperature error**	**The LED temperature reached an abnormal level.**
E06	**LED time error**	**The total irradiation time reached the replacement point.**
E07	**Calibration error**	**The UV intensity did not reach the set intensity.**
E08		
E09		
E10		
E11		
E12		
E13		
E14		
E15		

9 Safety Measures

9.1 Safety circuit

Aicure UJ20 is equipped with a safety circuit, which functions as follows, in case of a malfunction or accident.

1) f the cable between the LED head and the controller is broken, an error signal will be output and an error screen displayed.
2) If the LED head is short-circuited, an error signal will be output and an error screen displayed.
3) If the LED head temperature becomes excessively high, a warning signal will be output with a warning screen displayed.
4) If 5 V and GND are shorted by mistake during external terminal connections, the 5 V circuit will stop operation. When the short circuit is removed, the controller will automatically recover. Note, however, that if the short-circuited state lasts for an extended period, this product may be damaged.

10 Specifications

■ Overall specification

• Head specification

High power head	Part No. (Head alone)		ANUJ6150 High power head				
	Applicable lens	Spot dia. (mm)	ϕ3	ϕ4	ϕ6	ϕ8	ϕ10
		Part No. (lens alone)	ANUJ 6423	ANUJ 6424	ANUJ 6426	ANUJ 6428	ANUJ 6420
	Head/lens set part No.		ANUJ 61523	ANUJ 61524	ANUJ 61526	ANUJ 61528	ANUJ 61520
	Head block part No. Lens/lens/cable set		ANUJ 61523C	ANUJ 61524C	ANUJ 61526C	ANUJ 61528C	ANUJ 61520C
	Irradiation Intensity（mW/cm^2）*1		8000 mW/cm^2	6850 mW/cm^2	2990 mW/cm^2	1740 mW/cm^2	580 mW/cm^2
	Irradiation distance (mm)		10mm	12mm	20mm	25mm	30mm
	LED lamp		Max. output: 330 mW; Wavelength:365 ±5 nm; Class-3B LED system				
Standard head	Part No. (Head alone)		ANUJ6140 (Standard head)				
	Applicable lens	Spot dia. (mm)	ϕ3	ϕ4	ϕ6	ϕ8	ϕ10
		Part No. (lens alone)	ANUJ 6423	ANUJ 6424	ANUJ 6426	ANUJ 6428	ANUJ 6420
	Head/lens set part No.		ANUJ 61423	ANUJ 61424	ANUJ 61426	ANUJ 61428	ANUJ 61420
	Head block part No. Lens/lens/cable set		ANUJ 61423C	ANUJ 61424C	ANUJ 61426C	ANUJ 61428C	ANUJ 61420C
	Irradiation Intensity（mW/cm^2）*1		4000 mW/cm^2	3250 mW/cm^2	1530 mW/cm^2	850 mW/cm^2	260 mW/cm^2
	Irradiation distance (mm)		10mm	12mm	20mm	25mm	30mm
	LED lamp		Max. output: 150 mW; Wavelength:365 ±5 nm; Class-3B LED system				
High power/Standard	Estimated LED lamp life		20,000 hours (LED head temp. at 65ºC, max)				
	Operation temp. / humid. range		Controller: 5 to 35ºC, max. 85% (no condensation)				
	Storage temp. / humid. range		Controller: -10 to 60ºC, max. 85% (no condensation)				

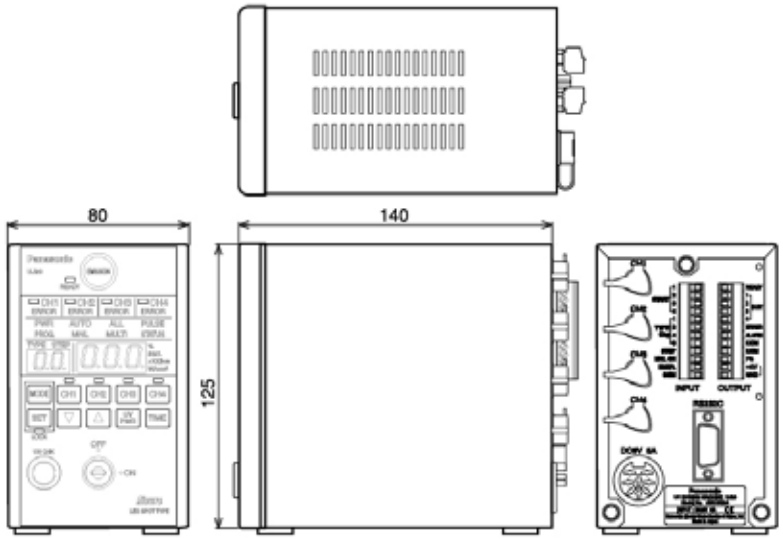
* 1: In power mode

• Controller

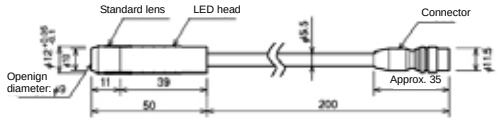
UJ20 controller product No.		ANUJ5024 (with AC adapter)
Connectable heads		1 to 4 heads
Connectable UV sensor		1 sensor (ANUJ6100 optional dedicated UV sensor)
UV irradiation		One program for Simple Mode and up to 15 user-definable programs (up to 10 steps each) The heads are collectively/individually controllable.
Type switching		Up to 16 irradiation programs can be stored and switched by external signals.
Intensity/irradiation control		Digital intensity and irradiation control Manual/timer control (0.1 to 999 sec.) Calibration function using the optional sensor for UJ20 only
Setting/Operation		Setting by the operation switches Power key switch
Display		Large color-switching LED display Large seven-segment LED display
External control	Ports	RS232C parallel I/O
	External input	Individual irradiation input, emergency stop input, interlock, full-irradiation input, manual irradiation switching, and product type switching
	External output	READY signal, error signal, warning output, BUSY output (each head separately), and +5 V output (for indicators)
Operating voltage		Supplied AC adapter: 100 to 240 V AC (±10%), 50/60 Hz, 60 VA (at 100 V AC)
Ambient temperature/ humidity range		Controller: 0 to 35°C, 85% max. (No condensation)
Storage temperature/ humidity		Controller: -10 to 60°C, 85% max. (No condensation)

11 Dimensions

● **Controller (Weight: 1.0 kg)** **ANUJ5024** (Unit: mm)
Excluding the projecting parts.

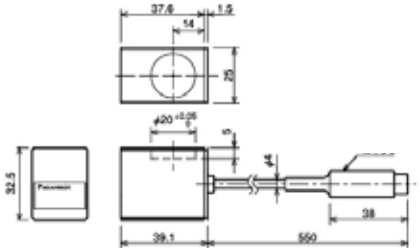


● **Head**



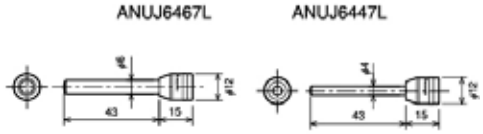
● **Connection cable** **ANUJ6220**

● **UV sensor** **ANUJ6100**

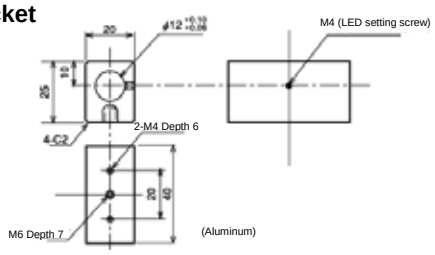


● **Normal lens**
Cylindrical lens

● **Rod lens**



● **Head mounting bracket** ANUJ6801



12 Options and spare parts list

12.1 Product numbers for placing orders

● Main units

Item	Specification		Product No.
Controller	UJ20 Controller (with AC adapter)		ANUJ5024
Head unit (Head, lens, and 1.7 m cable)	High power	With 3-mm dia. lens	ANUJ61523C
		With 4-mm dia. lens	ANUJ61524C
		With 6-mm dia. lens	ANUJ61526C
		With 8-mm dia. lens	ANUJ61528C
		With 10-mm dia. lens	ANUJ61520C
	Standard	With 3-mm dia. lens	ANUJ61423C
		With 4-mm dia. lens	ANUJ61424C
		With 6-mm dia. lens	ANUJ61426C
		With 8-mm dia. lens	ANUJ61428C
		With 10-mm dia. lens	ANUJ61420C

● Options

Item	Specification	Product No.
UV sensor	UV sensor for UJ20 only	ANUJ6100
Goggles	UV protective goggles	ANUP5001SG
Mounting bracket	Head mounting bracket	ANUJ6801

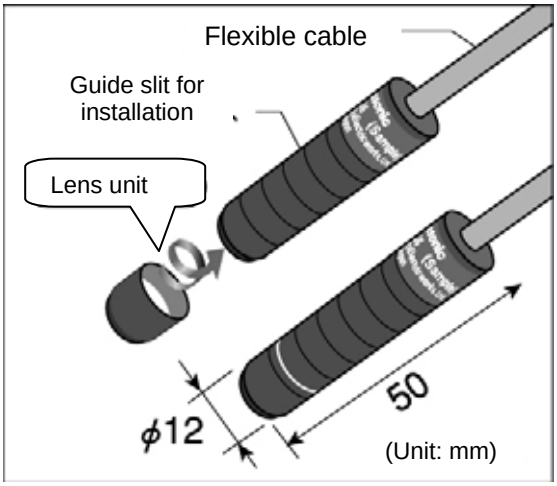
● Special lens (made to order)

Item	Specification	Product No.
Cylindrical lens	Cylindrical R5	ANUJ6450S
	Cylindrical R7.5	ANUJ6475S
Rod lens	4-mm dia., R7, L = 43 mm	ANUJ6447L
	6-mm dia., R7, L = 43 mm	ANUJ6467L

● Spare parts (unit components)

Item	Specification		Product No.
Head with lens	High power	With 3-mm dia. lens	ANUJ61523
		With 4-mm dia. lens	ANUJ61524
		With 6-mm dia. lens	ANUJ61526
		With 8-mm dia. lens	ANUJ61528
		With 10-mm dia. lens	ANUJ61520
	Standard	With 3-mm dia. lens	ANUJ61423
		With 4-mm dia. lens	ANUJ61424
		With 6-mm dia. lens	ANUJ61426
		With 8-mm dia. lens	ANUJ61428
		With 10-mm dia. lens	ANUJ61420
Head only	High power head		ANUJ6150
	Standard head		ANUJ6140
Lens unit	3-mm dia. lens		ANUJ6423
	4-mm dia. lens		ANUJ6424
	6-mm dia. lens		ANUJ6426
	8-mm dia. lens		ANUJ6428
	10-mm dia. lens		ANUJ6420
Connection cable	1.7 m Cable diameter: 5.5 mm		ANUJ6220
	3.0 m (made to order) Cable diameter: 5.5 mm		ANUJ6230
	5.0 m (made to order) Cable diameter: 7.6 mm		ANUJ6250
	7.0 m (made to order) Cable diameter: 7.6 mm		ANUJ6270
	10.0 m (made to order) Cable diameter: 7.6 mm		ANUJ6200
AC adapter	Adapter for UJ20 only: 100 to 240 V AC		ANUJ6802

12.2 How to replace the lens



1) Remove the label.
2) Remove the lens unit.
3) Attach the new lens unit.
4) Attach the label.

Warning

After removing the lens unit, prevent dust or other foreign substances from entering the new lens unit until it is attached.

13 Troubleshooting

Symptoms	Checks/Remedies
LED does not irradiate.	Did you select the target channel for the product type? (When selected, the channel switch is lit or flashing.) → Select the target channel when setting the product type. If the target channel is selected but does not irradiate, check if the UV intensity level is set to 0% for the channel program for the target product type. → If so, set the UV intensity level to 1% or higher.
When a warning message is displayed:	
Temperature warning	The channel connection indicator changes to orange (mixture of green and red) when the LED head temperature has reached the warning level. If you continue the operation in this condition, the product life will be significantly shortened, and the temperature may exceed the upper limit, causing an emergency stop. → Set the UV intensity level (%) lower or improve the heat radiation performance of the LED head to keep the temperature lower than the warning level.
Time warning	When the total irradiation time of the LED reaches the point 30 hours before the preset LED replacement point, the time warning is issued and “x100hrs” will be lit. When the time reaches the LED replacement point, the irradiation process will make an emergency stop. → Prepare a new LED head. After replacement, clear the total irradiation time.
When an error occurs:	
Interlock emergency stop “The interlock contact was opened during irradiation.”	The emergency stop contact was opened during irradiation in AUTO mode. -> Check the emergency stop contact or the external input terminal block. Close the contact and then restart irradiation. * If the emergency stop contact is open, normal resetting is not available. Hold down SET to forcibly reset the interlock.
Irradiation incomplete “The Irradiation was stopped before completion.”	An emergency stop was made during irradiation in AUTO mode. → Resolve the problem, and then restart irradiation.
Connection error “The LED was disconnected during irradiation.”	It is possible that the connection cable or LED head was broken. → Reset the error status, check the connection of the cable and LED head with the channel in question, and replace them if necessary.
LED wire broken “LED circuit opening was detected during irradiation.”	The current detection was stopped during irradiation in AUTO mode. It is possible that the connection cable or LED head was broken. → Reset the error status, check the connection of the connection cable and LED head with the channel in question, and replace them if necessary.
LED short-circuited “LED short-circuiting was detected during irradiation.”	An overcurrent was detected during irradiation in AUTO mode. It is possible that the connection cable or LED head was short-circuited. → Reset the error status, check the connection of the cable and LED head with the channel in question, and replace them if necessary.
LED temperature error “The LED temperature reached an abnormal temperature.”	The LED temperature exceeded the upper limit. → Set the UV intensity level (%) lower or improve the heat radiation performance of the LED head to keep the temperature lower than the warning level.
LED time error “The total irradiation time reached the replacement point.”	The total irradiation time of the LED reached the preset LED replacement point. (Or, it is possible that the LED replacement point was set ahead the total irradiation time.) → Reset the error status, replace the LED head, and then clear the total irradiation time. (Or, go to the mode setting screen and correctly set the LED replacement point.)
LED calibration error “Calibration uncompleted”	Calibration was stopped before completion. Or, the calibration was not successful. It is possible that the setting is too high, or there is a problem in the dedicated UV sensor (option). → Reset the error status, check the connection of the UV sensor, review the setting, and then retry calibration.

Manual revision history

Manual No.	Issued	Revision Details
	Jan. 2007	Initial version

Although our manuals are prepared with great care, if you should spot any errors, please let us know at the address below: Matsushita Electric Works, Ltd. Automation Control Device Division 1048 Kadoma, Kadoma City, Osaka 571-8686 Japan TEL: +81-6-6903-5129 (main switchboard)